RAILROAD GAZETTE

SATURDAY, JANUARY 13, 1872.

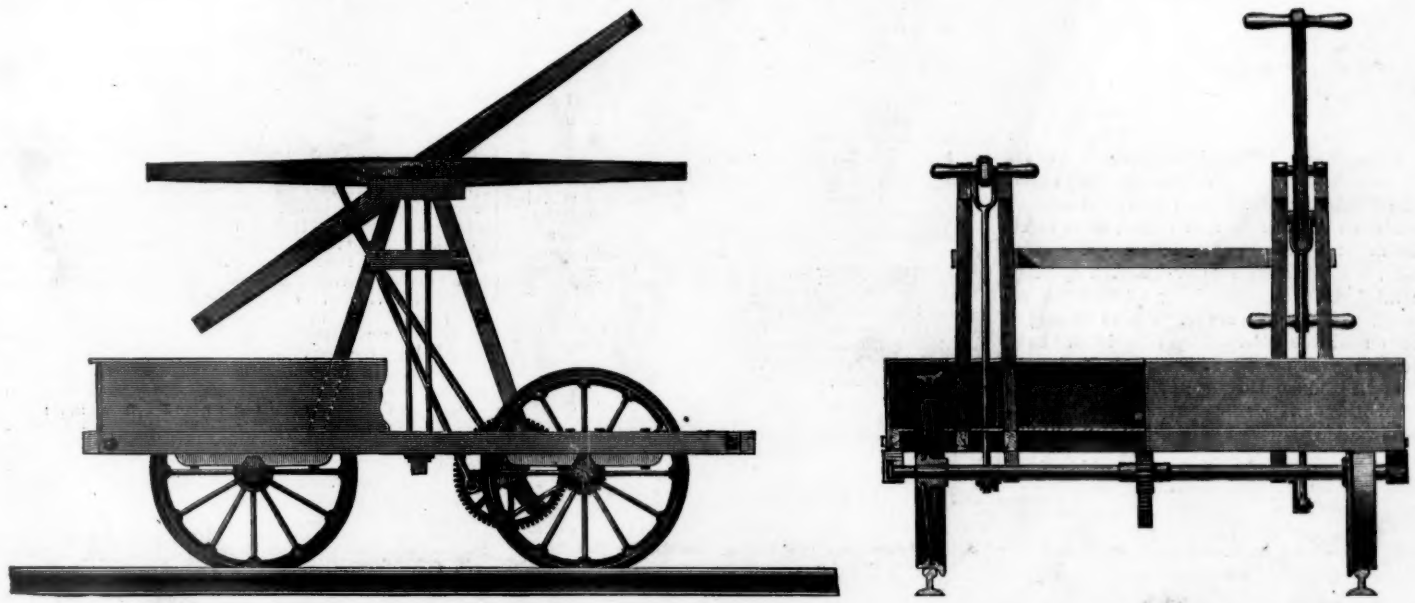
HAND CAR.

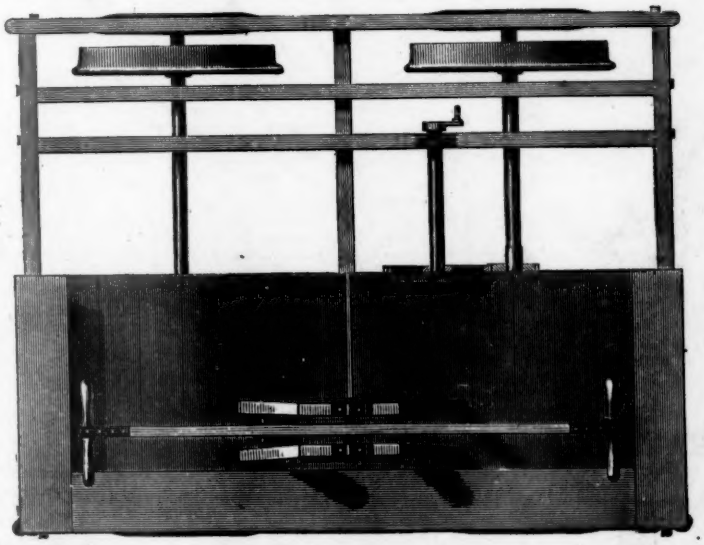
The engraving herewith represents a hand car used on the Louisville & Nashville Railroad, and which is not remarkable for any special novelty, but is an example of a good design of an ordinary subject. No explanation of it is requisite excepting that the scale is ½ inch — 1 fcot, so that measurements can be taken from it so as to enable any one to build a car from the engraving. We regret that we are not able to give the weight of the car, but we think it would be less than 50 lbs. per passenger, of which our narrow-gauge friends will please make a note, and also observe that the road is 5-feet gauge.

HAND CAR

Built in the Shops of the Louisville & Nashville Railroad Company, Louisville, Ky.—Thatcher Perkins, Superintendent of Machinery.

Scale ½ inch — 1 foot.





Prices of Rails in December.

Bigelow & Johnston, of No. 48 Pine street, New York, report the following prices current for rails for the month ending December 31, 1871:

New Rails.	Gold.	Currency.	Import, Tons.
English	$58 @ 59		20,500
American		$70 @ 71	
Total import this month			20,500
Import since January 1			200,123
Total to date			220,623
Same time 1870			145,819
Old Rails.			
Double heads	$40 @ 41		
T or Flange	$39½ @ 40		
U or Bridge	Nominal.		3,667
Total import this month			3,667
Import since January 1			57,017
Total to date			60,684
Same time 1870			54,545

Contributions.

NOTES ON THE MANAGEMENT AND DISCIPLINE OF AMERICAN RAILROADS.

BY A HINDOO.

[CONTINUED FROM PAGE 396.]

In the RAILROAD GAZETTE, issue of December 23, I notice that one G. N. Palmer had recovered $3,000 from the Charlotte, Columbia & Augusta Railroad Company managers for ejectment from one of the company's cars on the occasion of his attempting to ride with a ticket of expired date. Unfortunately full details are not given in the report. Three thousand dollars seems an enormous sum in proportion to the inconvenience suffered by the claimant. There surely must have been attendant circumstances of an aggravating character, such as unnecessary violence, refusal to allow claimant to proceed on tendering the fare, or special loss must have been proved as resulting from the delay.

In the Supreme Court of Maine, recently, Miss Adeline Norris recovered $600 damages from the Grank Trunk Railway Company under similar circumstances. In June, 1857, Miss Norris bought a ticket from Portland to North Stratford, and stopped over at Northumberland. On the next train the conductor refused to recognize her check and put her off the train, obliging her to take another conveyance, and in this process to take cold. According to testimony the cold has ever since held to her. Hence the suit which resulted in an award of $600 damages.

Here again, unfortunately, the most important particulars are not given, so that we have no guide to the motives of the jury in giving excessive damages to plaintiff. A report of the judge's charge to the jury and pleading of the plaintiff in each case would be valuable to many readers of the GAZETTE.

If these decisions are good in law, it is time for railroad officers to bestir themselves, erase from their tickets the objectionable words, "Good for this day and train only," and devise some other method of attaining the same result which will be more agreeable to the law; or they should combine to obtain legislation giving railroad companies the right to limit the currency of tickets to the date of issue.

The law declares that railroad corporations, as common carriers, cannot limit their liability by any notice or assumed contract. Nothing short of a contract for consideration is recognized. But the rights and privileges cannot be all on one side and the pains and penalties on the other. It is right that the common carrier, having been granted a monopoly, should be prevented from using that monopoly to the injury of those who granted and sustain it. If it be shown that arbitrary rules and regulations, causing inconvenience to passengers, which are not absolutely necessary to protection of the shareholders' interests, are enforced, juries are justified in deciding against such rules. In the courts of common law railroad companies do not always find justice. They are judged by a body (the jury) in which they have no representative; by a body which is "in opposition." These bodies are composed, as a rule, of men who have no knowledge of the interior economy of railroad management, and are, therefore, not well fitted to decide what rule is necessary, or what one is arbitrary and unjustifiable: moreover, they are somewhat impatient and suspicious of evidence given by the railroad officers.

The people are stronger than the corporations; for, powerful as some of the latter may be, their power is only a corruption that lives on itself. Hence we see in all free countries signs of an incipient determination on the part of the people to control their railroads. Governor Brown, of Missouri, advises the people of that State to insist on—

1. "Inspection in all that concerns the security to life.
2. "Equal facilities to freight.
3. "Uniformity of charge to all.
4. "Systematic dispatch of trains.
5. "Making of proper connection with each other.
6. "The establishment of telegraphic lines and stations, and other details that subsequently come within the scope of police regulations."

When the Governor's suggestions become law, the railroads will have become, to all intents and purposes, "State property," and that difficulty will have been overcome which Governor Brown says "is always present when the line is attempted to be drawn between the immunities that attach to private investment, and the superior control that must reside somewhere in every social State."

With fixed mileage rates and equal facilities to all, managers need no longer rack their brains to devise the best method of fostering the territory from which they draw their traffic; competition is then narrowed to equipment and train service. I believe that the country would be best served by such a state of things; no other conditions could insure such facilities and completeness of transportation. While in the matter of equipment, the American people are better served than those of any other country, they are no less favored in immunity from vexatious restrictions and regulations; yet in the matter of safety and train service they are worse off than they need be. There is no system that can be called discipline—but of this, more anon.

To return to our "muttons"—the expired-date ticket question. Is the regulation requiring conductors to refuse such tickets an improper one? The traveler purchases a ticket from station 1 to station 20; he pays for the right to ride a distance of 200 miles. Has the railroad company a right to say that he must complete his journey within twenty-four hours after purchase of the

ticket? Here two questions present themselves. 1st. Why should the company object to the passenger breaking his journey as often as he chooses, provided he do not travel over more road than the ticket entitles him to? 2d. Why cannot the passenger comply with the company's rule and purchase a ticket from place to place instead of for the whole journey? In reply to the first query, railroad companies object for two reasons. 1st, If tickets remain good for a lengthened period, the company may be defrauded by parties using them more than once. 2d. Local fares are often higher than through ones.

If tickets are good for more than one day, a man buying a ticket from No. 1 to No. 20 station may ride to No. 20, keeping his ticket in his possession, go back a succeeding day to No. 2, and on the same ticket ride a second time to No. 20, repeating the operation *ad infinitum*.

In reply to the second query: A passenger setting out on his journey may intend to go through to the end; but after being seated he is taken ill, or receives information which necessitates his stopping over at a way station. Under such circumstances, what right has the railroad company to take advantage of the passenger's misfortune and mulct him in a fine? Now, if the railroad company had no means of guarding against fraud except by the rule referred to, it might have some show in its favor; but when, as is the fact, it is able to protect itself effectually without doing the least injustice to the passenger, it has no excuse for continuing a course opposed to the convenience of the people. Railroad companies would find it pay well if they would inclose their stations and collect tickets there instead of in the cars. Tickets for stations beyond would be punched with the number of the station at which the passenger stays over, so that the conductor would know what distance had been traveled on it. There are, of course, many objections which might be urged to the inclosing of stations in this way, but none are insuperable. All openings could be fitted with turnstiles giving entrance but no egress, except at the principal one. Parties wishing to meet friends might be admitted by free ticket. Such arrangements may not be so acceptable to the public as the present style of doing business; but as the public insist on their pound of flesh, railroad companies can hardly be blamed for adopting all the precautions necessary to secure the full measure of payment allowed them.

TO BE CONTINUED.

CAR PROPULSION BY PNEUMATIC POWER.

BY JAMES A. WHITNEY, MECHANICAL ENGINEER.

[Paper read before the the New York Society of Practical Engineering, January 3, 1872.]

Long after the success of Stephenson's engines was assured, and the superiority of locomotive traction to that of ropes actuated from stationary engines fully demonstrated, there were not wanting projectors and engineers who sought, at much cost of invention and money, to substitute the now universal mode of railway propulsion by one in which the traveling motor should be dispensed with. Nor were these without plausible argument, nor have their efforts, untruitful in their time, been unproductive of much that may be of value now and hereafter. The original cost of a locomotive, as compared with that of a stationary motive power, is approximately as five to one; it requires a fireman as well as an engineer, while an ordinary stationary engine is well cared for by a single attendant; it cannot ascend steep grades, and in wear and tear is subject to rapid and often to dangerous deterioration, even with a degree of attention which with most fixed engines and steam-generators is unusual. Add to this that the economy of fuel is much greater with the latter than the former, and that fuel of poorer quality may be used, and there is good reason apparent for the numerous plans for transferring the power derived from the steam-engine by some other agency than that of direct connection by pitman, crank and axle. Foremost of these projects has been that of using atmospheric air under pressure, which has been proposed in many different forms. In open country and in direct competition with the locomotive system, it came to grief in every instance. This was not wholly a result of any engineering or mechanical objection—although such were not wanting—for a line between Paris and St. Germain was open to passenger traffic for a period of fourteen years, but on the score of expense, which was found excessive.

But it must be remembered that the experiments commonly held to have settled the impracticability of the system were prosecuted under conditions the most favorable to steam locomotives as ordinarily defined. In the exigencies, however, of the present, as concerns passenger traffic in large cities, circumstances are wholly changed. On account of noise, of smoke, of the frightening of horses and of uncomfortably heating the vehicles in summer, steam cannot be used to advantage on city or street cars; neither, for several of the reasons just noted, should its use be attempted in tunnels; neither, on account of the vibrations incident to a locomotive, should such be allowed on elevated ways, in which the permanent stability of the supporting structure must largely depend on the absence of disintegrating causes like that just mentioned, and on which the dangers of leaving the track, of collisions and the like, would, under the stress and crowding of city transit, be largely in excess of those experienced on common railways. It is acknowledged that horse-power is already inadequate to the needs of New York city street railways; the transmission of power by wire ropes, as illustrated in the elevated railway on Greenwich street, has proved a mediocre and insufficient method of propulsion; and in pneumatic power alone does there appear to be promise sufficient to justify the outlay that will be required in thoroughly testing any improved system of propulsion. We use the term improved as distinct from the term new, for the plans which offer the most utility are in their essential principles quite old, some older than the locomotive itself, and the modifications which will render them practicable will, quite likely, be in themselves very slight. But the importance of little things cannot be overestimated in adapting an engineering principle to actual use. It was the adoption of the grooved rail, permitting the flanges of the car-wheels to keep them on the track while the surfaces of the latter lay flush with the street surface so as to offer no impediment to ordinary vehicles, that rendered street railways practicable. Had it been attempted to retain the T-rail, the city tramways, enabling two horses to draw five times as much as the team of an omnibus on a Broadway pavement, would not, as they have done, gridironed every large city in this country, made their way as an evidence of American enterprise into the capitals of Europe, and trailed their iron length along the streets of Stamboul, as it is stated they are now about to do. A careful working out of the details in the apparatus employed, the adaptation of one or the other variety of pneumatic propelling mechanism to the precise conditions most favorable to its success, and the application of more efficient means in the prosecution of the work than was possible with the inferior workshop practice of forty years will, we have faith, bring about a practical change in city and suburban locomotion ultimately valuable in every city having more than fifty thousand inhabitants in the civilized world. To suggest methods by which, as the writer believes, this may be most readily and effectually brought about, is the object of the present paper.

Propulsion by pneumatic pressure may be properly divided under three heads, viz., that embracing the driving of a car or carrier bodily through a tube, either by an air-blast behind it, or by pressure induced in rear by a partial vacuum in front; that in which a piston, operated in the same manner as in the former, but in a tube of smaller diameter, is connected to a car running on rails outside; and that in which air under compression is admitted to engines in lieu of steam, the engines being thus actuated to turn the wheels of the vehicle by appropriate connections. In the first, a low pressure acting on an area, if anything, larger than the cross-section of the car is used; its greatest advantage is that, as hitherto applied, the car has been projected in darkness through a subterrene tube, reliance being had mainly upon artificial illumination. The second requires a comparatively high pressure, acting upon an area proportionally smaller than the car section, and the cause of its failure after long trial was the leaking of the longitudinal valve, whereby connection was allowed between the piston and the car arranged externally. The third is simply the use of air-springs, in which power is stored by compression, to be slowly given out as the air is passed to and through the engine-cylinders; among the objections attending its use is the difficulty of maintaining a uniform pressure in the supply to the engine; but of much more practical importance is the liability to freeze, induced in the engine from the heat rendered latent by the expansion of the air. These, the just-enumerated principal defects incident to each modification of the pneumatic system, do not seem, in either case, to be beyond the reach of remedy, but in none does the theory or practice of such remedy appear to have been properly wrought out with special reference to the peculiar needs and conditions of city passenger transit.

The several varieties of pneumatic propulsion appear to have grown out, as it were, one from another, in a kind of natural sequence. It is sixty-one years since James Medhurst, in England, proposed to drive cars by an air-blast through a brick tunnel, furnished with longitudinal ledges to support the rails upon which the car-wheels were to run: it is presumed that the air-current was to be produced by an apparatus similar to the blowers used in iron furnaces of that time. Fourteen years later, James Vallance patented a plan in which the air was to be exhausted in front of the car, and from the two it was but a step to combine them in such manner as to secure a maximum of speed. Apparently reflecting upon the evident objections to a tunnel railway, Medhurst, in 1827, seventeen years from the date of his first project, planned what is really the germ of the second sub-system. This comprised a tube submerged throughout its length in water, and with an opening longitudinally in its under side, from each edge of which flanges projected downward, so that a water lute of several inches depth was provided to the opening. A piston, propelled by atmospheric pressure, was to traverse within the tube, and, connected by a thin metallic blade or bar with the train upon the external track above, would propel the same. The idea, impracticable in this form, was taken up by Henry Pinkus, who made the longitudinal opening in the upper part of the tube or main, and placed in appropriate relation thereto a flexible rope to serve as a valve. As the piston—moved by the pressure behind, obtained by the action of air-pumps exhausting in front of the piston—moved forward, it lifted the rope or valve to permit the passage of the colter or connection between the car or cars outside and the piston within. Although the external pressure of the air upon the valve was calculated to keep the latter in place, it was found to leak badly, and the plan amounted to nothing In 1839, Samuel Clegg patented, in England, a valve adapted to the longitudinal slot of the tube, and remarkable for the ingenious adaptation of its structure to the end proposed. The valve was "made of a double strap of leather or raw-hide riveted between two iron plates, the top plate wider than the slot or opening, and the lower one falling into it when the valve was closed, thus completing the cylindrical form of the interior of the pipe, which had been destroyed by the aperture cut in it." One edge of the leather was allowed to rise, the other being screwed down firmly to the surface of the pipe. The lifting edge lay, when closed, against a composition of beeswax and tallow, placed on the edge adjacent and serving as a solder. The leading carriage of the train carried a trough filled with burning charcoal, and having a blade of copper projecting downward from it. This blade, being kept continually hot, and coming in contact with the valve after the passing of the colter, melted the waxy composition, and cemented the lifting edge of the valve firmly to its seat, thereby hermetically closing the tube to provide for the passage or propulsion of the succeeding train. Samuda combined with this a method of dividing the tube into sections of any desired length, and separated from each other by valves. Those valves were actuated each by contact of the leading car on an external lever connecting with the pivotal bearing of the valve. This enabled a vacuum to be maintained separately in each section to propel the train its entire length, without interference with the movement of a train on any adjacent section. Means were also provided for stopping the car by air cushioned in the end of each section on the closure of the valve, independent of the movement of the train. Such was the construction of the celebrated atmospheric railway of thirty years or thereabouts ago, lines of which were laid, as previously intimated, in France, between Paris and St. Germain, and in Ireland between Kingston and Dalkey, and which, in one instance where the leading vehicle of a train became accidentally detached, showed its capability of propelling a single car at the rate of seventy miles an hour.

The difficulty of keeping the tube or main, with its longitudinal valve, in perfect working order having been quite manifest in the comparatively successful experiments of Clegg and Samuda, and much more so in those of Pinkus, it was natural that some appliance other than the valve should be sought for in order to communicate pneumatic power from the stationary engine to the traveling car. It was doubtless this that, in 1844, led Pierre Armand Fontainemoreau to propose a pipe or main laid lengthwise of the track, and either kept filled with air under pressure or subjected to the action of an air pump to maintain therein a vacuum more or less complete. In the former case the main was to be furnished at intervals with valves opening inward. The locomotive was provided with two cylinders properly arranged in relation to the driving axle, and furnished with devices which automatically operated the valves in the main to supply the cylinders with compressed air, in the same manner as those of an ordinary locomotive are supplied with steam from the boiler. In the event of using a vacuum in the main, the action of the engines was simply reversed, air being exhausted from in front of the pistons so that the latter would be operated by the direct pressure of the atmosphere. So far as we know, no practical trial of this was made, but with the addition of a tank to receive a supply of compressed air in lieu of feeding the engines direct from the main, Fontainemoreau's plan might stand as the type of one of the subdivisions of the third class of pneumatic motors; for this class includes three sub-systems—that in which the air is compressed in a main extending the whole length of the line, and calculated to supply the air to the locomotive tank automatically and without stopping the train; that in which a similar main is proposed, but the cars stopped for the temporary connection of the tanks; and that in which a separate compressing power and compressed air-reservoir is provided at every station. The first of these, from its theoretical completeness, is apt to please the fancy of projectors, but from the extreme accuracy required in the fittings will probably never prove particularly successful. The second has the merit of concentrating the power in few places along the route, and of requiring but a minimum of attendance, but involves the necessity of keeping an extremely great volume of air constantly compressed. The third—although multiplying the number of engines and reservoirs—will, all things considered, probably meet with the most favor when this method of storing up power for car propulsion is tested as its merits, theoretically at least, deserve.

Names of Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I would call the attention of the readers of the GAZETTE to the subject of appropriate names for locomotives—a matter probably of but little consequence to a railroad, but one which may leave a pleasant impression, or none at all, with a traveler. Standing at a station, a train goes by; he reads some one's name upon it, supposes it one of the directors', and cares nothing about it; whereas if it happens to be a name characteristic of the train, or in some way connected with the history of that section of the country, it is apt to leave a much more lasting impression of the road. I know very little of the New Jersey Central Railroad, but remember it pleasantly simply from the particular appropriateness of the name of one of its engines, the "Quickstep." We might have such names as the "Shooting Star," or "Meteor," for passenger trains, and for freight such as are indicative of strength; then for a class of engines run on gravel and extra trains we might have the "Wild Cat" or the "Lynx."

For a road in a section of country where Mr. Cooper has introduced us to Natty Bumpo, what could be better than the "Deerslayer," the "Pathfinder," the "Pioneer," or the "Spy."

And on the Rensselaer & Saratoga Road, for instance, being, as it is, the route to Lake George, if we observed the "Horicon" or the "St. Sacrament," being the names

by which this lake was first known, they would recall to our minds the days when the Indian alone frequented the spot, or the early sway of the French in that locality, and the struggles between them and the English upon the borders of this clear sheet. We have scores of Indian and other names, much more pleasing to the eye and ear than those of Tom, Dick and Harry that we see in such flaming letters on the handsomely-painted tender. Or, if we must have the name of an individual, give us such as are known to the whole country, accompanied by his portrait on the side of the head-lamp.

Mr. Director, no one cares a straw whether it's your name or Guy Fawkes' that confronts him. Put your names on your little switching engines, and keep them in your stock-yards.

A. ROVER.

Slipping on Curves.

WESTFIELD, N. Y., January 8, 1872.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of January 6, page 423, I noticed a question in reference to the slippage of locomotive driving-wheels on curves. I inclose you an answer: if it meets your approval please insert in your columns.

Take for example a track, its gauge being 4 feet 8½ inches, the outer rail elevated say three inches above the inner, 1½ inches play between the flanges and the rails, the radius of the curve such as to well balance and centralize the locomotive at a given speed, say 20 miles per hour, preventing either inner or outer flange from coming in contact with the rail. In such case the bearing surface or friction would be the same upon the inner and outer rails, consequently the slippage is the same on both sides.

But if, for example, you increase your speed, say to the rate of 35 or 40 miles per hour on this same curve, it, as a natural result, brings the flanges of the outer wheels in contact with the rails, giving from 50 to 75 per cent. greater surface or adhesion on the outside rails, and the slippage in this case is entirely on the inner rail.

And again, the more you increase your speed above the given 20 miles per hour the greater the weight on the outer and the less on the inner. If there were no flanges on the driving-wheels, running at a speed of 35 miles per hour on the given track would place at least 5,000 pounds more weight upon the outer wheels than upon the inner. Dispensing with the flanges so as to dispose of the additional friction received by them, the wheels carrying the lighter weight must yield to the heavier. The slippage must, therefore, be upon the inside wheels.

WM. CRANDELL.

Chicago Railroad News.

We give in connection with this news the number of regular trains on the various roads at the close of the year, as some index to the traffic of the city at that time.

Illinois Central.

This company runs two through passenger trains daily between Chicago and Cairo, each way. There is one train each day to Gilman, and five local trains running to Hyde Park. The number of departing and arriving trains on the 29th of December was 16. The Kankakee and the Effingham trains were withdrawn in November, as they always have been. The trains are the same in number as last year.

The directors of the Illinois Central Railroad Company have declared a semi-annual dividend of five per cent., payable Feb. 1. The transfer books close on the 13th inst. The company is prepared to pay its seven per cent. construction bonds, maturing April 1, 1875, having placed at the disposal of the trustees $1,077,500 more, making $2,630,000 in the sinking fund, which, with the accumulation of interest, will pay the three millions of outstanding bonds, the fund being applicable at once to the payment of bonds when presented.

The company has presented to each of the following officers a gold watch, in token of their services in saving the company's property during the great fire: A. Mitchell, General Superintendent; W. K. Acker, Treasurer; Joseph F. Tucker, General Freight Agent; L. H. Clarke, Chief Engineer, and S. J. Hayes, Superintendent of Machinery. On each was an inscription, with the name of W. H. Osborn, the Chairman of the Executive Committee, stating that the watch was presented for services during the fire.

Chicago, Rock Island & Pacific.

This road had four passenger trains each way per day at the end of the year. Two of these were through trains and two local. The local trains have their termini at Peoria and at Blue Island. The number of regular freight trains each way was eight, making 24 trains per day both ways over the road.

Chicago, Burlington & Quincy.

This road sends from 11 to 12 passenger trains out of the city each day, an equal number arriving. The freight trains each way average from 23 to 25 per day, so that the total number of trains daily both ways was from 65 to 70. Many of these trains run not further than Aurora. At Mendota and at Galesburg the remainder of the trains subdivide and are re-formed, so that it is difficult to say exactly how many through trains there are. As soon as the Chicago & Iowa road is opened, which is expected to be done within a few days, three of the Mendota freight trains will be withdrawn and placed upon the Chicago & Iowa road.

The schedule trains of the Chicago, Burlington & Quincy road were 22 passenger trains and 30 freight trains, both ways, leaving the remaining number to be made up with extra freight trains, of which there are always more or less.

The large amount of business on this road has made it necessary to double-track the road, a work which has been commenced with vigor, and will be prosecuted until it is completed. The double track is already graded to Aurora, the masonry and bridges are nearly completed, and the first of April will see the road double-tracked to Aurora. The new rails laid by this company are all of steel.

Michigan Central.

On the 29th of December 12 trains left the city and nine arrived, all of which were through trains. Of these five trains each way were passenger. This is the same number of trains as were on the road a year ago.

This company put a new passenger and express train on the road on Monday last to run from Chicago to Muskegon. It leaves Chicago at 8:30 p. m., and arrives at 6 a. m. This takes the place of the 9 o'clock train which formerly ran from Chicago to New Buffalo.

This company is placing all the extra cars it can get on the Michigan branches to accommodate the immense freight business which depends upon the furnishing of Chicago with building material.

Lake Shore & Michigan Southern.

The Michigan Southern road, on the 29th ult., sent out from this city 5 passenger trains and 9 freight trains—all through trains. A like number arrived in this city on the same day.

Mr. F. E. Morse, General Passenger Agent, arrived in this city early this week, having spent over two weeks on the road between San Francisco and Chicago, the greater portion of which time was occupied in digging out of the immense snow drifts which were encountered.

This company has a double track to Englewood, a distance of seven miles from the center of the city, and will continue the double track next summer as far as Calumet, twelve miles. It is the intention of the company to push work as rapidly as possible on other sections of the line, until the company shall possess a double track throughout the entire length of the road.

Chicago & Alton.

This road has had great difficulties to contend with during the month of December, and the result has been a large falling off in its receipts. The decrease has been caused by the ice in the river at St. Louis and at Louisiana. At St. Louis no cars have been transported across the river for several weeks, and at Louisiana the crossing the river has been entirely closed for a similar period of time.

The following is a statement of the receipts of the road for the month of December, and also for the year ending December 31:

	1871.	1870.		
Receipts from Dec. 24 to 31.	$76,709 94	$95,150 95	Dec.	$18,441 01
Receipts from Dec. 1 to 31..	369,420 77	404,263 93	Dec.	37,843 16
Receipts for year ending Dec. 31, 1871.....	5,278,092 69	4,949,004 89	Inc.	429,087 80

It will be seen that for the last week in December there was a decrease of $18,441.01 for the receipts of the corresponding week of the year before. Also that there was a decrease of $37,843.16 for the month of December. In contrast with these figures, however, the receipts for the entire year 1871 show an increase of $429,087.80 over the receipts for the year 1870.

This road at the close of last year ran four through passenger trains each way and 13 freight trains, making 34 in and out trains, including freight and passenger.

Chicago and Iowa.

On Monday, the 8th inst., the Chicago & Iowa Railroad went into operation, with one passenger and one freight train each way between Aurora and Forreston, a distance of 81¼ miles. The following is the list of stations, with their distances from Chicago. The trains are incorporated with the Chicago, Burlington & Quincy trains at Aurora for Chicago, and with the Illinois Central trains at Forreston for Dubuque:

Aurora	38½	Steward	79¼
West Aurora	39½	Rochelle	83½
C., B. & Q. Junction	40	Flag Center	88¾
Sugar Grove	46¼	Chana	95
Blunt	51¾	Daysville	98
Hinckley	57	Oregon	101
Waterman	63¾	Mt. Morris	108¼
Cornton	69	Switch	114¾
Lee	73½	Forreston	119¾

A passenger train in connection with that leaving Chicago at 2:25 p. m. leaves Aurora at 4:20 p. m., and arrives at Forreston at 9:00 p. m. Returning, it leaves Forreston at 6:00 a. m., and reaches Aurora at 10:25 a. m. and Chicago at 12:15 p. m.

Condition of Traffic.

All railroads, except such as have met with detentions on account of ice in the Mississippi River, report increased earnings for the month of December. There have been no detentions of trains between Chicago and the East on account of snow. Indeed, there is but very little snow at present, nor has there been over that section of country up to the present time. The streets of Chicago, and the country in its immediate vicinity, are entirely bare, and have been for about two weeks. In fact, there has been no sleighing in the city since Thanksgiving, and about a week subsequently to that day. The passenger business is reported to be unusually good, and all the roads are doing all that they have facilities for doing in the way of freight transportation.

Rebuilding.

The mild weather that has existed in Chicago for the last two weeks has been improved to its fullest extent by the builders, and enough brick structures have been erected to destroy, to a great extent, the vastness of the ruins which can be taken in at a single glance. The buildings have probably not been put up in a very substantial manner. Some of them have already tumbled down. But things have been lively, and most of the winter-erected structures will undoubtedly stand both as monuments of the enterprise of their owners and as structures in which a great deal of business is to be done next season. The business section of the South Division is destined to be entirely changed. The great wholesale houses and the banks are rapidly centering at a point only two or three blocks in extent just east of the Madison street bridge and the Washington street tunnel. The Chicago *Times* will build a magnificent structure in the spring on the corner of Washington and Wells streets, or what is now called Fifth avenue. The Tribune Company have commenced the rebuilding of their old office on the corner of Madison and Dearborn streets.

Potter Palmer's hotel, having reached the second story, is left until spring, when work will be pushed ahead rapidly.

The debris has been nearly all cleared away from the ruins of the Pacific Hotel, and it is the design of the company having it in charge to get it rebuilt so as to be opened by the first of January, 1873.

Wabash avenue to Twenty-second street has been changed into a business street. Three or four years ago a certain man tried to put up a business front in this thoroughfare near Twelfth street, and he received so many hints that his building would be burned down if he did it, that he abandoned the project. But since the fire brick fronts have been constructed in many points on the avenue, projecting beyond the old residences, and thoroughly destroying the views from the swell fronts and bay windows of the palatial residences. And the result is that everybody is disgusted with the street as a place for a home. Those who have not already packed up their lares and penates and sought other places to set them up will do so early in the season. The glory has departed from Wabash avenue, and the houses are rapidly being transformed so as to accommodate the bustling needs of commerce.

There never was so much travel in the city as there has been since the fire. The street cars seem always to be full, and several new omnibus lines have been put on, and all seem to be doing a thriving business.

THE SCRAP HEAP.

Rail Trade in 1871.

From the annual review of Bigelow & Johnston we take the following:

"*New Rails.*—Our importations for the year again show a large increase, and notwithstanding an accession to the number of American rolling mills devoted to the manufacture of this article, we are still compelled to make large drafts on the foreign market. Prices have not varied a great deal for some months, but during the year the advance has been equal to four or five dollars per ton in foreign rails. The greater relative cheapness of these rails is very tempting to railroad companies and contractors, who have generally a limited amount of money allotted to each mile, and no great restrictions imposed upon them as to make, and whose only anxiety is to cause the money to go as far as possible. But even were foreign rails higher than American, they will continue to be largely taken, so long as we must lean on the foreign capitalist for the means of construction to so large an extent as we now do.

"*American Rails* have not varied much in price, and with the increase in the cost of raw material the margin of profit has been greatly reduced and frequently annihilated. Where credit, too, has been given, as is generally the case, the excessive stringency of the market for discounting business paper during the last three months has been very destructive to profits. However, apart from these drawbacks, the mills have been generally well employed at fairly remunerative rates, and as English rails are now costing in currency almost as much as the home-made article, we fully anticipate ere long a decided advance in the price of the latter.

"*Bessemer Steel Rails* are coming greatly into use on all our old and wealthy roads having a heavy traffic. The manufacture in this country, though as yet confined to a few concerns, is making satisfactory progress, and bids fair to assume large dimensions.

"*Old Rails.*—The consumption of this article has increased, but not so greatly as to call for any particular comment. It is unquestionably of great importance to the majority of our rolling mills that the supply should not diminish, and the introduction of the old foreign material at the moderate scrap-iron duty has been a great boon, when the cost and comparative scarcity of good forge irons have been considered. Prices have fluctuated very little for several months, but the increasing cost abroad makes it plain that to get our proper supply we must have some advance here, otherwise the high prices now obtained for re-rolling will send the bulk of the English supply into consumption at home. It is somewhat difficult to get at the total import of this article during 1871, but we estimate it at about 140,000 tons. Below we give the monthly quotations:

	Jan'y.	Feb'y.	March.	April.	May.	June.
D. H.	39	38¾	39½	40	40	40
T.	38	38	38½	39	39	39
	July.	Aug.	Sept.	Oct.	Nov.	Dec.
D. H.	40	39½	39½	39½	39¾	39½
T.	39	39	38½	38½	38½	39

"As usual, the bulk of our imports consists of the double-head section so common on English Railways. This is generally preferred by consumers and brings the highest price. Next in order comes the flange or T section, of which the continent of Europe sends us the largest proportion. The bridge or U section is not a favorite. As our remarks may pass under the notice of shippers abroad as well as receivers here, it may be well to observe as a caution, that no waste or refuse new rails, however unfit for use, are admissable under the old rail duty. They must not only be 'fit only for manufacture' but must also 'have been in actual use.' Careful attention to this at the port of shipment will save much expense and trouble at point of delivery."

RAILROAD GAZETTE

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A. N. KELLOGG, *Proprietor.*

S. WRIGHT DUNNING AND M. N. FORNEY, *Editors.*

W. H. BOARDMAN, *Acting Publisher.*

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Editorial Announcements.

Address.—The RAILROAD GAZETTE *will be printed for the present in New York; our printing house in Chicago having been destroyed. All communications, therefore, whether editorial or business, should be directed to the New York office. The proprietor will receive subscriptions and advertisements at his office in Chicago, Nos. 63 and 65 South Canal street, but letters should be addressed to New York.*

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

RAILROAD CONSTRUCTION IN THE UNITED STATES IN 1871.

We have compiled with great care a history of the railroad extension in the United States during the year 1871, giving the miles of track of each line laid within the year, and the location in each case. We have arranged the several lines according to the States, as they are given below. It has been our intention to give for each railroad the number of miles of new road on which track was actually laid during the year, and not the amount of grading done or the miles nearly completed, or the amount which companies two or three months or more ago promised to have completed, our experience having led us to distrust statements of the kind, and to be confident of the completion of any line or section by fixed time only, when at that time we learn that the track is actually laid. But we have taken the utmost pains to be accurate, and while, doubtless, there are some errors in this summary, we are confident that the aggregate of the excess or omissions of mileage reported will be very small, most especially the former. The labor necessary to the compilation of these statistics has been very great, extending, in fact, throughout the year. Almost absolute accuracy and completeness could have been secured but for the Chicago fire, which destroyed our most important records and left us dependent upon memory and our files for much of the information which we here present.

The activity in construction during the year, as the figures show unmistakably, has been extraordinary. The total mileage added to the railroad system of the country was 6,983 miles.

The most accurate statement of the mileage of the railroads of the United States at the close of 1870 (that given by Poor's Manual of Railroads), fixes the amount at 53,399 miles. This gives 60,382 miles of railroad in the United States at the present time, the increase during the past year having been 13 per cent. The same authority shows the increase in 1870 to have been 6,145, and in 1869 4,999 miles. The percentage of increase in 1870 was very nearly 12½ per cent.

The following tabulated statement of the railroad progress of the United States shows at a glance the mileage at the close of each year and the increase for each year. We take it from Poor's Manual, adding our own figures for 1871:

Year.	Miles in Operation.	Annual Increase of Mileage	Year.	Miles in Operation.	Annual Increase of Mileage.
1830	23	....	1851	10,982	1.961
1831	95	72	1852	12,908	1,926
1832	229	134	1853	15,360	2,452
1833	380	151	1854	16,720	1,360
1834	633	253	1855	18,374	1.654
1835	1,098	265	1856	22,017	3.643
1836	1,273	175	1857	24.508	2,491
1837	1,497	224	1858	26,962	2,460
1838	1,913	416	1859	28,789	1,821
1839	2,302	389	1860	30,635	1,846
1840	2,818	515	1871	31,256	621
1841	3 535	717	1862	32,120	864
1842	4,026	491	1863	33,170	1,050
1843	4,185	159	1864	33,908	738
1844	4 377	192	1865	35,185	1,277
1845	4,633	256	1866	37,017	1,832
1846	4,939	297	1867	39,244	2 227
1847	5,599	669	1868	42,277	3,033
1848	5,996	397	1869	47,254	4,999
1849	7,365	1,369	1870	53,399	6,145
1850	9,021	1.656	1871	60,382	6,983

The following is a table of the miles of railroad completed in 1871 in the several States and Territories:

Maine	106	Arkansas	37
New Hampshire	64	Kentucky	142
Vermont	83	Ohio	174
Massachusetts	117	Michigan	478
Connecticut	190	Indiana	340
New York	348	Illinois	902
New Jersey	160	Wisconsin	314
Pennsylvania	364	Minnesota	451
Maryland	115	Iowa	461
Virginia	19	Nebraska	210
West Virginia	98	Missouri	508
North Carolina	15	Kansas	270
South Carolina	80	Indian Territory	124
Georgia	95	Colorado	76
Florida	12	Nevada	16
Alabama	173	Washington Territory	25
Louisiana	57	Oregon	55
Texas	205	California	99

By this it appears that the increase in New England was 560 miles; in the Middle Atlantic States, 872 miles; in the South Atlantic States (Maryland to Georgia inclusive), 422 miles; in the Gulf States, 447 miles; in the Southern Central States (Arkansas, Tennessee and Kentucky), 179 miles; in the Northern Central States (Ohio, Michigan and Indiana), 992 miles; in the Northwestern States (including all the other States east of the Rocky Mountains), 3,116 miles; in the Territories, 225 miles; in the Pacific States, 170 miles.

Taking the figures for the beginning of 1871 from Poor's Manual again, we have the following as the mileage of each State and Territory at the beginning of the years 1871 and 1872:

States and Territories.	Area in square miles.	Mileage. 1871.	Mileage. 1872.
1. Maine	31,776	786	892
2. New Hampshire	9,280	736	800
3. Vermont	10,212	614	699
4. Massachusetts	7,800	1,480	1,597
5. Rhode Island	1,306	136	136
6. Connecticut	4,674	742	932
7. New York	47,000	3,928	4,276
8. New Jersey	8,320	1,125	1 285
9. Pennsylvania	46,000	4,656	5,020
10. Delaware	2,120	224	224
11. Maryland	11,184	671	786
12. Columbia, District of	60	...	...
13. West Virginia	23,000	387	485
14. Virginia	40,904	1,485	1,504
15. North Carolina	70,704	1,178	1,193
16. South Carolina	29.385	1,137	1,219
17. Georgia	58,000	1,845	1,940
18. Florida	59,268	446	458
19. Alabama	50,722	1,429	1,602
20. Mississippi	47,156	990	990
21. Louisiana	41,346	478	536
22. Texas	237,504	711	916
23. Arkansas	52,198	256	293
24. Tennessee	45.600	1,492	1.492
25. Kentucky	37,600	1,017	1.159
26. Ohio	39 964	3,538	3,712
27. Michigan	56.451	1,638	2.116
28. Indiana	33,809	3,177	3.517
29. Illinois	55,410	4,824	5.725
30. Wisconsin	53,924	1,525	1.839
31. Minnesota	83.531	1.072	1.523
32. Iowa	55,045	2,683	3.144
33. Nebraska	75,995	588	798
34. Missouri	65.350	2,000	2.508
35. Kansas	81,312	1,501	1,771
36. California	188,981	925	1,024
37. Nevada	112,090	593	600
38. Oregon	95,244	159	214
39. Arizona Territory	113 916	...	...
40. Colorado "	104,500	368	444
41. Dakota "	147,490	...	...
42. Idaho "	90,932	...	...
43. Montana "	143,776	...	...
44. New Mexico "	121,991	...	...
45. Utah "	80,056	364	364
46. Washington "	69,994	...	25
47. Wyoming "	93,107	492	...
Total, United States	2,915,208	53,399	60,382

Mr. Poor's book was published in June, 1871, and it is quite possible that the figures taken from it include a portion of the mileage completed early in that year.

It is noticeable that the construction in the Eastern and older States was chiefly of short lines, indicating that these States are already pretty well supplied. In the West most of the lines are much longer and some of great extent, the country growing rapidly and demanding and rendering profitable additional facilities for carrying its traffic.

The following is a record of the track-laying on each new line in the United States during the year:

MAINE.

The railroads constructed in Maine have been important as well as numerous, especially the European & North American, which connects the railroad system of the Maritime Provinces, and will soon give them an outlet at Halifax, the easternmost port of America in the path of European steamers.

European & North American.—Extended from Mattawamkeag eastward 56 miles to St. Croix, there connecting with the European & North American of New Brunswick.

Knox & Lincoln.—Track laid during the year throughout its length, from Bath northeast and east, near the coast, to Rockland, 46½ miles.

Portland & Rochester.—At the beginning of the year open from Portland west to Alfred, 32 miles. Completed in 1871 to Rochester, N. H., 20½ miles.

Bangor & Piscataquis.—Extended from Foxcroft to Guilford.

Portland & Ogdensburg.—This railroad has been extended from its last year's terminus at Baldwin, 30 miles from Portland, northwest to North Conway, N.H., 30 miles. About 8 miles of this extension is in New Hampshire.

NEW HAMPSHIRE.

Portsmouth, Great Falls & Conway.—Extended from Union (37 miles north of Portsmouth) northward to Conway Corner, 41 miles.

Sugar River Railroad.—This road, which forms the western extension of the Concord & Claremont, has been extended from Bradford westward to Newport, about 15 miles.

Portland & Ogdensburg.—Constructed from the Maine line northwestward to North Conway, about 8 miles.

VERMONT.

Portland & Ogdensburg.—The Vermont section of this road, known as the "Western Division," formed by a consolidation of the Montpelier & St Johnsbury, the Lamoille Valley and the Essex County Railroad, has been completed from St. Johnsbury northwest to South Hardwick, 26 miles. On other parts of the line 24 miles of track has been laid.

Addison County Railroad.—Completed from its junction with the Rutland Railroad at Whiting west to Lake Champlain opposite Ticonderoga, 13 miles.

Missisquoi Railroad.—Completed from St. Albans eastward, near the northern border of the State, to Enosburgh Falls, 20 miles.

MASSACHUSETTS.

There is, besides those noted as completed below, one railroad of considerable length, the Massachussets Central, in progress in this State, and numerous short lines of local importance, some of which may have some track laid.

Framingham & Lowell—Completed from Framingham northward to Lowell, 26 miles.

Boston, Barre & Gardner.—Completed from Worcester northwest to Gardner, 26½ miles.

Athol & Enfield.—Track laid from Athol southwestward to Enfield, 30 miles.

Holyoke & Westfield.—Completed from Westfield, at the junction of the Boston & Albany and New Haven & Nothampton roads, northeast to Holyoke, 12 miles.

Duxbury & Cohasset.—Completed from Cohasset, where it connects with the South Shore Railroad, southward near the coast to Duxbury, 17½ miles.

Mount Tom & Easthampton.—A branch of the Connecticut River Railroad, about five miles long, completed during the year.

CONNECTICUT.

Connecticut Western.—Completed from Hartford, Conn., westward to a junction with the New York & Harlem and Dutchess & Columbia roads, at Millerton, N. Y., 67½ miles.

Connecticut Valley.—Completed from Hartford southeast down the east bank of the Connecticut River to the sea at Saybrook Point, 44 miles.

Shepaug Valley.—Completed from Hawleyville, on the Housatonic Railroad, northeast to Litchfield, 32½ miles.

New Haven, Middletown & Willimantic.—Track laid early in the year from New Haven to Middletown, 23 miles.

Boston, Hartford & Erie.—Track extended from Putnam, on the Norwich & Worcester Railroad, southeast to Willimantic, 23 miles.

NEW YORK.

There are probably some omissions in the summary of New York roads, the lines being mostly short and not widely known. The most important line progressing is the New York & Oswego Midland, which is in a more forward condition than the figures relating to track-laying would indicate, the completion of some very heavy rock cuttings and tunnels and the leasing of some short

roads which will form part of the main line having left it really but little to do to complete the line.

Dutchess & Columbia.—Track laid early in the season from Pine Plains, then its eastern terminus, 43 miles from Dutchess Junction, on the Hudson River Railroad 45 miles north of New York, northeast 15¼ miles to a junction with the Harlem Railroad at Millerton, where now is the western terminus of the Connecticut Western.

Hudson River & Harlem Connection.—A line from the Hudson River road one mile south of Spuyten Duyvil southward along the east side of Harlem River to the Harlem Railroad at Mott Haven. Two miles long.

Walkill Valley.—Extended and opened for business early in the year from New Paltz northeast to Rosendale, 5 miles, and very nearly completed at the close of the year from Rosendale to Kingston, 13¾ miles.

New York & Oswego Midland.—Extended from Sidney Plains northeastward about 60 miles, nearly completing it to its connection with the New Jersey Midland. At the close of the year it had 278 miles of road, including branches, the main line being then about 200 miles long, a part of it being formed by the Middletown & Unionville Railroad, which it has leased.

Lackawanna & Susquehanna.—Completed from the Albany & Susquehanna Railroad near Harpersville, southward down the Susquehanna to the junction of the Erie and the Jefferson roads at Lanesboro, 19 miles, of which 15 is in New York. It is operated by the Delaware & Hudson Canal Company.

Adirondack.—Extended from The Glen, 44 miles north of Saratoga, northwestward 16 miles to North River.

Utica & Black River.—Extended from Lowville, 59 miles north of Utica, northward 16 miles to Carthage.

Syracuse & Chenango Valley.—Track laid during the year from Syracuse southeast 17 miles to a point within three miles of Cazenovia.

Buffalo Junction.—A line around the city of Buffalo connecting the various railroads which enter the city. It is seven miles in length.

Buffalo, New York & Philadelphia.—Extended from South Wales, 22 miles southeast of Buffalo, southward 13 miles to Arcade, and nearly completed to the Erie Railway at Olean, about 40 miles further.

Syracuse & Northern.—Track laid on the entire line from Syracuse north to a junction with the Rome, Watertown & Ogdensburg Railroad at Sandy Creek, a distance of 44 miles.

Dunkirk, Warren & Pittsburgh.—Track laid from Dunkirk south to Warren, Pa., 54 miles (about 12 miles in Pennsylvania).

Erie & Genesee Valley.—Completed from Mount Morris, Livingston County, southeast twenty-four miles to Dansville.

Middletown & Cranford.—Constructed from Middletown, on the Erie Railway 66 miles northwest of New York, northwest 13 miles to Cranford. Leased to the New York & Oswego Midland.

Monticello & Port Jervis.—Extended from a point 12 miles north of Port Jervis 11¼ miles to Monticello. Operated by the Erie Company.

Rondout & Oswego.—Track extended from Mooresburg northeast about 34 miles.

NEW JERSEY.

Several of these New Jersey roads are of more than local importance, especially the Midland, which will bring the New York & Oswego Midland to New York, and the West Line, which, if certain desirable connections are authorized by the Legislature, will have a large coal traffic from Pennsylvania. Other lines make accessible what was lately the wilderness of Southern New Jersey. A number of lines are still in progress in this State.

New Jersey West Line.—Completed from a junction with the Morris & Essex at Summit, 22 miles west of New York, westward to Bernardsville, 25 miles.

Central of New Jersey.—A branch constructed from a point on the Newark & New York road near Newark southward to a junction with its main line near Elizabethport, about 8 miles.

New Jersey Midland.—Completed from a point four miles below Hackensack in a northwestward direction to Snufftown, and from the New York line at Unionville southeast to Ogdensburg, in all 59 miles. About ten miles of track will complete it.

Montclair Railway.—Completed from Midvale to Little Falls, 17 miles.

Tuckerton Railroad.—Completed from Whitings, on the New Jersey Southern, southward to Tuckerton, 29 miles.

Vineland Railroad.—Extended from Vineland southeast to Delaware Bay at Bay Side, 22 miles.

PENNSYLVANIA.

The lines constructed in Pennsylvania have been chiefly short roads, many chiefly to make coal and iron mines accessible, the State being very well supplied with "through" lines, and such lines finding extreme difficulty in obtaining authority from the Legislature. The completion of the Pittsburgh & Connellsville (which, however, was chiefly constructed before 1871) was an event of importance. A very important work is in progress in the "Bennett's Branch" extension of the Allegheny River road, which will give the Pennsylvania Railroad a low grade line for freight across the Alleghenies, very largely reducing the cost of handling. A very large number of short lines are in progress or soon to be commenced, and the prospect for a large increase in mileage during 1872 is very promising.

Sunbury & Lewistown.—Track laid on the whole line from Selin's Grove, on the Northern Central Railway 28 miles north of Harrisburg and five miles south of Sunbury, southwestward to the Pennsylvania Railroad at Lewistown, 43 miles. Leased by the Pennsylvania Railroad Company.

Morrison's Cove.—A branch of the Hollidaysburg Branch of the Pennsylvania Railroad, completed from Hollidaysburg (eight miles south of Altoona) southeastward 22 miles to Leathercracker.

Butler Branch.—This railroad, from Freeport northwest 21 miles to Butler, was opened for traffic January 18, 1871, but was almost entirely constructed in 1870. It is operated by the Pennsylvania Railroad.

Huntington & Broad Top.—This branch of the Pennsylvania Railroad was extended from Mount Dallas westward to Bedford, eight miles.

Lewisburg, Center & Tyrone—Completed from Lewisburg (on the Philadelphia and Erie Railroad 63 miles north of Harrisburg) westward to Mifflinsburgh, 10 miles.

Perkiomen Railroad.—This branch of the Reading road was extended from Schwencksville north eight miles to Green Lane.

Pickering Valley.—A branch of the Reading, constructed from Phœnixville southwest to Byers, 11 miles.

Mount Pleasant & Broad Ford.—A branch of the Pittsburgh & Connellsville Railroad completed from Broad Ford, 55 miles southeast of Pittsburgh, northward to Mount Pleasant, nine miles.

Southern Pennsylvania.—Completed from its junction with the Cumberland Valley Railroad at Marion (58 miles southwest of Harrisburg) west 11¼ miles to Bridgeport, and thence north 13 miles to Cowan's Gap, with a branch from Bridgeport northwest to Mercersburg, 3½ miles : in all 28 miles.

Catawissa Railroad.—Extended from Milton up the Susquehanna to Williamsport, 25 miles. Hitherto it has used the track of the Philadelphia & Erie between these places.

Chartiers Railroad.—Extended from Cannonsburg southwest to a connection with the Hempfield Railroad at Washington, 8 miles.

Union & Titusville.—Completed from Titusville northwestward to Union, 25 miles. This road has the six-feet gauge and connects with the Atlantic & Great Western. It is operated by the Oil Creek & Allegheny River Company.

Somerset Branch.—A branch of the Pittsburgh & Connellsville Railroad, completed from Mineral Point, 102 miles from Pittsburgh, northeastward to Somerset, nine miles.

Sullivan & Erie.—Completed from its junction with the Barclay Coal Railroad at Monroeton (four miles southeast of Towanda) south to Bernice, 24 miles.

Lackawanna & Susquehanna.—Completed from Lanesboro, at the junction of the Jefferson and the Erie roads, north to the Albany & Susquehanna road at Harpersville, 19 miles. Only four miles of it is in Pennsylvania.

Pittsburgh & Connellsville.—About 70 miles of the track of this road was laid in 1871, 62 miles in Pennsylvania.

Lehigh Valley.—The Penn Haven & Hazelton Branch has been extended to a junction with the Danville, Hazelton & Wilkesbarre road at the Deringer Central Coal Works, 12½ miles.

Daguscahonda Railroad.—Constructed from the Philadelphia & Erie Railroad at Daguscahonda south to Earley, about five miles.

Wellsborough & Lawrenceville.—Completed from Lawrenceville, on the New York line, where it forms a junction with the Blossburg & Corning Branch of the Erie Railway, south by west to Antrim Coal Mines, 28 miles.

Danville, Hazelton & Wilkesbarre.—Extended from Catawissa eastward to a junction with a branch of the Lehigh Valley eight miles west of Hazelton, a distance of 23 miles.

MARYLAND.

Cumberland Valley.—Track extended from Hagerstown southwest to the Potomac at Powell's Bend, 10 miles.

Frederick & Pennsylvania Line.—Track laid from Littlestown, Pa., the terminus of the Littlestown Branch of the Hanover Branch Railroad, southwest to Taneytown, 8 miles, 5½ of which are in Maryland.

Western Maryland.—Track extended from Mechanicsville, west by north, 26 miles to Hagerstown.

Queen Anne's & Kent.—Track laid from its junction with the Kent County Railroad at Massey's Cross Roads, southwest 26 miles, to Centerville.

Pittsburgh & Connellsville—Track laid on the part of the line in Maryland, 8 miles.

Baltimore & Potomac.—Track laid for about 25 miles southwest of Baltimore on the main line, and for 15 miles on the Washington Branch.

VIRGINIA.

This seems a beggarly account, but it is nevertheless true that there has been unusual activity in construction during the past year in this State. The Richmond, Fredericksburg & Potomac Company has very nearly completed a short extension of its Quantico Branch to the Potomac at Quantico Landing ; the Alexandria & Fredericksburg road has been graded and made ready for quick completion ; considerable progress has been made in an extension of the Washington & Ohio road from Hamilton to Winchester; the Lynchburg & Danville road has been graded for a large part of its length ; and preparations have been made for the construction of other important lines.

Winchester & Strasburg.—Completed from Winchester southwest to Strasburg, 19 miles, forming an extension of the Baltimore & Ohio Company's Shenandoah Valley line.

WEST VIRGINIA.

Chesapeake & Ohio.—Western Division completed from the terminus of the road at Huntington, on the Ohio River near the mouth of the Kanawha, eastward to the mouth of New River at Charleston, W. Va., 98 miles.

NORTH CAROLINA.

We think that one or two short lines have been completed in this State, the names and locations of which we have not been able to ascertain. Preparations have been made for the construction of a line from Salisbury southeastward to meet the Northeastern road of South Carolina. Some grading has been done for lines which extend westward from the line between Danville and Charlotte, and there are rumors again that means are secured for the completion of the Western road across the mountains to East Tennessee.

Chatham Railroad.—Extended from Haywood (29 miles southwest of Raleigh) southwest 15 miles to Sanford, on the Western Railroad.

SOUTH CAROLINA.

Port Royal Railroad.—Track laid from the deep-water terminus at Battery Point, on Port Royal Island, northwest 41 miles.

Wilmington, Columbia & Augusta.—A branch was constructed from Sumter west to Columbia, 42 miles.

GEORGIA

Besides the construction noted below, a number of lines in this State have had a considerable amount of work done during the year. The most important of these, perhaps, is the Atlanta & Richmond Air Line, on which a large amount of grading has been done, both in Georgia and South Carolina. A considerable portion of the Bainbridge, Cuthbert & Columbus Railroad, from Columbus southwest, has been graded, and also of the Brunswick & Albany between Albany and Eufaula. Grading has been commenced on a branch of the Southwestern from Albany southwest to Blakely, and on other roads.

Brunswick & Albany.—Track extended from Willicoochee, 100 miles west of Brunswick, west to Albany, 72 miles.

Cherokee Railroad.—Track was laid on this railroad (late the Cartersville & Van Wert) from the Western & Atlantic Railroad at Cartersville southwest to Van Wert, 23 miles.

FLORIDA.

A very important contract was made last summer for the completion of the Jacksonville, Pensacola & Mobile Railroad westward about 200 miles, entirely across West Florida, whose traffic it will be well able to carry. Work is in progress on this line.

Jacksonville, Pensacola & Mobile.—Track extended from Quincy west 12 miles.

ALABAMA.

A number of lines had sections completed, or very nearly so, at the close of last year, and it is possible that some of these had part of their track laid in 1871. The most important of the lines completed is the Alabama & Chattanooga, which completes the shortest existing line between New Orleans and New York. An important line in progress, with considerable grading done north of the completed section, is the South and North Alabama, which will complete a short north and south line from Lake Michigan to Mobile and Pensacola. General Forrest's "Selma, Marion & Memphis" road has been graded nearly across the State and was to be completed to Columbus, Miss., by this time. A very long line put under contract lately is the Mobile & Northwestern, most of which, however, will be in Mississippi. Very little progress, so far as we can learn, has been made with the Mobile & Alabama Grank Trunk or the Selma & Gulf.

Montgomery & Eufaula.—Completed by the construction of an extension from Union Springs southwest to Eufaula, 40 miles.

Vicksburg & Brunswick.—Track laid from Eufaula west to Clayton, 21 miles.

Alabama & Chattanooga.—Completed by the laying of track on the section from Green Pond (170 miles southeast of Chattanooga) southeast 53 miles to Akron.

South & North Alabama.—Extended from Calera (63 miles north of Montgomery) north 34 miles to a junction with the Alabama & Chattanooga road at Birmingham.

Mobile & Alabama Grand Trunk.—Track laid from Mobile north 20 miles.

Tuskegee Railroad.—A line of three-feet gauge completed from Chehaw southwest to Tuskegee, five miles.

LOUISIANA.

New Orleans, Mobile & Texas.—Completed from a point opposite New Orleans up the Mississippi to Donaldsonville, 57 miles.

TEXAS.

The lines completed in this State are chiefly important and promising. The International will probably be the longest within the borders of any single State. The Houston & Texas Central will soon be completed to Red River, opening rail communication between Galveston and Kansas City and the Great Lakes. The construction of the Texas Pacific is likely to be commenced during the current year. Also a connection will be made with a railroad across Louisiana to New Orleans, which is very much needed.

Southern Pacific.—Extended from Hallville west to Longview, 10 miles.

Houston & Great Northern.—Completed from Houston north 65 miles.

Houston & Texas Central.—Extended from Kosse north to Corsicana, 58 miles.

Western Division extended from Burton west to Austin, 22 miles.

International.—Completed from Hearne, on the Houston & Texas Central 120 miles above Houston, northeast to Jouitt, 50 miles.

ARKANSAS.

The work done in this State is disappointing. At the close of 1870 there was a large mileage on several different lines nearly ready for the iron, and the completion of the Little Rock & Fort Smith, the Little Rock, Pine Bluff & New Orleans and a considerable extension of the Cairo & Fulton and the Ouachita & Red River was reasonably to be expected. The Little Rock & Fort Smith is likely to be completed soon, and the Cairo & Fulton considerably extended, if not completed, during the year.

Memphis & Little Rock.—This road was completed early in the year by the laying of 15 miles of track.

Little Rock & Fort Smith.—There was a section of the road, 50 miles long, ready for the iron at the beginning of the year; but we have no information that any track was laid during the year.

Little Rock, Pine Bluff & New Orleans.—This road had 16 miles of track laid at the beginning of the year, and by the latest report had 2¼ miles more.

Cairo & Fulton.—Early in the year the track was laid from Cairo northwest 20 miles, and in November the road-bed was nearly ready for 30 miles further, and it was promised that track would be laid on this section by the end of the year. We have no information, however, that this has been done.

Arkansas Central.—This railroad was made ready for the iron from Helena a little west of north to White River at Aberdeen, a distance of 45 miles, and it was to have the track laid on this section; but we have no information that it has been done. It is of 3-feet gauge.

KENTUCKY.

The completion of the Elizabethtown & Kentucky and the Maysville & Lexington is expected this season, and the Lexington and Big Sandy is likely to be commenced and advanced rapidly. Before the end of two years there will probably be a line from east to west across the State, connecting with the Chesapeake & Ohio. An effort is making to secure the construction of the Kentucky and Great Eastern, from Covington (opposite Cincinnati) down the Ohio to the Virginia line.

Elizabethtown & Paducah.—Extended from Caseyville (43 miles west of Elizabetown) west to Nortonville, 67 miles.

Owensboro & Russellville.—Track laid from the Ohio River at Owensboro south to Livermore, on Green River, a distance of 21 miles.

Maysville & Lexington.—Completed from the Ohio River at Maysville southwest to Carlisle, 35 miles.

Shelby Railroad.—Track laid from Anchorage (12 miles east of Louisville on the Louisville & Lexington line) east by south 19 miles, to Shelbyville.

OHIO.

A large amount of grading has been done on the Mansfield, Coldwater & Lake Michigan road, and on the Cincinnati & Dayton Air line, which latter is very nearly ready for the track. Work is progressing on, and prospects for completion are favorable for the Atlantic & Lake Erie, a long line from Toledo southeast to the Ohio River. The Baltimore, Pittsburgh & Chicago, a new line from Pittsburgh to Chicago, will probably soon be put under contract across the State, and efforts are making for the construction of a line from Dayton southeast to a connection with the Chesapeake & Ohio.

Marietta & Pittsburgh.—Extended from the previous year's terminus (six miles south of Marietta) northward to Caldwell, 29 miles.

Newark, Somerset & Straitsville.—Completed from Newark (the junction of the Central Ohio and the Lake Erie division of the Baltimore & Ohio) southward 43 miles to Straitsville. Leased to the Baltimore & Ohio.

Lake Shore & Tuscarawas Valley.—Constructed from Cleveland southward through Medina to Seville, on the Atlantic & Great Western, a distance of 42 miles.

Cincinnati & Muskingum Valley.—This railroad (formerly the Cincinnati & Zanesville) was extended from Zanesville north to a connection with the Pittsburgh, Cincinnati & St. Louis Railway at Dresden, a distance of 16 miles.

Painesville & Youngstown.—Completed from Painesville south by east to Chardon, 12 miles. It is of three-feet gauge.

Columbus, Springfield & Cincinnati.—Completed from Columbus west to New London, 20 miles, completing a line from Springfield to Columbus which will form a part of the Cleveland, Sandusky & Cincinnati system.

Liberty & Vienna.—Completed from Liberty, on the Cleveland & Pittsburgh road, near the Pennsylvania line, north to Vienna, 10 miles.

Cincinnati & Baltimore.—This road is six miles long and affords the Marietta & Cincinnati an entrance into Cincinnati. Two miles of it were completed in 1871.

MICHIGAN.

The extraordinary activity in construction in this State is the more remarkable because it has not been encouraged in any way by the votes of aid from municipalities. When the decision of the Supreme Court in 1870 put an end to such subsidies, and the Constitution was so amended as to forbid the future authorization of such subsidies, it was prophesied that there would not only be a great decrease but almost a total cessation in railroad construction in the State thereafter. But there never was so much activity in construction as in 1871; many important lines have been completed, and many unimportant ones have found means for construction. There has been a large amount of local aid, it is true, but it has come in the shape of voluntary private subscriptions, and not in taxes. The Grand Rapids & Indiana and the Jackson Landing & Saginaw are progressing rapidly toward Mackinaw; the Chicago & Michigan Lake Shore will doubtless reach Manistee this year; the Chicago & Canada Southern is well under way across the southern end of the State; the Mansfield, Coldwater & Michigan has been graded for a considerable distance; the Northern Central, a branch of the Lake Shore & Michigan Southern from Jonesville northward, has been graded for a considerable distance, and threatens eventually to reach the line of the Flint & Pere Marquette, if not Mackinaw itself; the Detroit & Bay City is under contract, and progress has been made with other lines of more or less importance.

Detroit, Lansing & Lake Michigan.—Completed from Detroit northwest to Lansing, 85 miles, and from Greenville northwest to Howard on the Grand Rapids & Indiana road, 20 miles.

Michigan Air Line.—The eastern division, which reached from the Grand Trunk at Ridgeway west to Romeo, 16 miles, has been extended west to Washington, 6 miles.

Jackson, Lansing & Saginaw.—Extended from Kawkawlin (20 miles north of Saginaw) northward to Wells, 45 miles.

Michigan Lake Shore.—Extended from Allegan eastward to the Grand Rapids & Indiana Railroad at Monteith, 11 miles.

Houghton & Ontonagon.—Six miles of track laid.

Port Huron & Lake Michigan.—Extended from Lapeer west to Flint, 19 miles.

Detroit, Hillsdale & Indiana.—Extended from Hillsdale southwest to a junction with the Fort Wayne, Jackson & Saginaw road at Banker's, five miles. Its trains run over the latter road from Banker's to Auburn, 45 miles, and thence over the Detroit, Eel River & Illinois road southwestward as far as completed.

Peninsular.—Extended from Climax southwest to South Bend, Ind., 65 miles, 55 of which is in Michigan.

Niles & South Bend.—From Niles south to South Bend, Ind., 13 miles, 6 miles in Michigan. A branch of the Michigan Central.

Chicago & Michigan Lake Shore.—Track extended early in the season from Grand Junction (the crossing of the Kalamazoo & South Haven) north to Nunica, 49 miles, completing the line from Battle Creek to Montague, and in December from Montague north to Greenwood, 6 miles, a total extension of 55 miles.

Grand Rapids & Holland.—Completed from Holland northeast to Grand Rapids, 25½ miles. A branch of the Chicago & Michigan Lake Shore.

Flint & Pere Marquette.—Extended during the year from Clare west 40 miles to a junction with the Grand Rapids & Indiana road at Reed City.

Grand Rapids & Indiana.—Extended from Paris north 36 miles.

Holly, Wayne & Monroe.—Completed from Monroe to Holly, 63½ miles. Much of the grading had been done before 1871.

INDIANA.

Detroit, Eel River & Illinois.—Constructed from Auburn (on the Jackson & Saginaw road 23 miles north of Fort Wayne) southwest to Roann, 55 miles. It is operated in connection with the Detroit, Hillsdale & Indiana road.

Indianapolis, Peru & Chicago.—Extended from Laporte northwest to a connection with the Michigan Central at Michigan City, a distance of 13 miles.

Warsaw, Goshen & White Pigeon.—Track laid from a connection with the Air line of the Lake Shore & Michigan at Goshen due south to Warsaw, 24 miles.

Lafayette, Bloomington & Mississippi.—Track laid from Lafayette west to the Illinois line, 37 miles.

Logansport, Crawfordsville & Southwestern.—Extended from Frankfort northeast 5 miles to Kilmore, and from Colfax southwest 49 miles to Rockville, the northern terminus of the Evansville & Crawfordsville Railroad, and forming now a line 64 miles long from Rockville northeastward to Kilmore.

Cincinnati, Lafayette & Chicago.—Constructed from Templeton, a station on the Lafayette, Bloomington & Mississippi Railway 16 miles west of Lafayette, northwest 45 miles to St. Anne, Ill., on the Chicago, Danville & Vincennes road. It has the use of the Lafayette & Bloomington road into Lafayette. Twenty-four miles are in Indiana.

Cincinnati, Richmond & Fort Wayne.—Extended from Winchester (25 miles north of its southern terminus at Richmond) northward 71 miles to Fort Wayne. It is leased by the Grand Rapids & Indiana Railroad, and has a contract for the use of the Cincinnati, Richmond & Chicago road from Richmond to Cincinnati.

Peninsular.—The part of this railroad in Indiana, from South Bend to the Michigan line, 10 miles, was completed in 1871.

Niles & South Bend.—This branch of the Michigan Central, from South Bend, Ind., north to Niles, Mich., is 13 miles long, 7 of which is in Indiana, all constructed in 1871.

Evansville, Terre Haute & Chicago.—Completed by the construction of the northern section from Newport (31 miles north of Terre Haute) to Danville, Ill., 24 miles, 18 miles being in Indiana.

St. Louis & Southeastern.—The part of this road in Indiana, constructed in 1871, is 27 miles long.

ILLINOIS.

The vast progress made in this State needs no further comment than the figures make. The total of 902 miles is nearly twice as much as that of any other State. A large amount of work has been done in the southern and central parts of the State, where, indeed, there was most room for new railroads. Still, few of these railroads are very long, and the State is eminent for the number as well as the aggregate length of its new lines. Of the lines on which considerable work has been done without any tracklaying, the Decatur & State line, the Chicago, Pekin & Southwestern, the Plymouth, Kankakee & Pacific, the Cairo & St. Louis and the Peoria, Atlanta & Decatur may be mentioned. It is not probable, however, that there will be as much construction this current year as last, and more is to be expected in the completion of unfinished lines than in the projecting and constructing of new ones, though there is promise of considerable activity in the latter direction.

Chicago & Iowa.—Extended from a point about half way between Rochelle and Oregon, northwest 24 miles to Forreston, on the Illinois Central.

Chicago, Burlington & Quincy.—Fox River Valley line extended from Aurora north to Geneva, 11¼ miles.

Prophetstown Branch extended from Prophetstown northwest to the Mississippi opposite Clinton, Iowa, 16 miles. The track was laid on this branch for about 20 miles early in the year.

Chicago & Rock River.—The western section of this railroad, from Rock Falls (opposite Sterling, on the Chicago & Northwestern Railway) has been completed 20 miles east by south to Amboy, on the Illinois Central.

Illinois Farmers.—This road, constructed in 1870 from Jacksonville southeast 20 miles to Waverly, was ex-

tended in 1871 to Virden, on the Chicago & Alton, 12 miles.

Toledo, Peoria & Warsaw.—A branch completed from La Harpe northwest 10 miles to a connection with the Burlington & Quincy line of the Chicago, Burlington & Quincy Railroad, over which it has an entrance into Burlington.

Peoria & Rock Island.—Completed by the laying of the track from a point about ten miles northwest of Peoria, where track-laying was suspended in 1870, northwest to Orion, 63 miles.

Chester & Tamaroa.—Constructed early in the season from Tamaroa, on the Illinois Central, 80 miles north of Cairo, southwest 10 miles to Pinckneyville, and in December very nearly finished through to Chester, 34 miles further.

Chicago & Alton.—Track laid on Louisiana Branch from Roodhouse, on the Jacksonville Division 21 miles south of Jacksonville, west 38 miles to the Mississippi, opposite Louisiana, Mo.

Bloomington & Ohio River.—Constructed from Bement, on the Toledo, Wabash & Western Railway, south 25 miles to Sullivan.

Decatur, Sullivan & Mattoon.—Constructed from Mattoon northwest through Sullivan to Decatur, 40 miles.

Paris & Decatur.—Completed from Paris west by north to Oakland, 18 miles.

Lafayette, Bloomington & Mississippi.—Track laid from Bloomington east 55 miles.

St. Louis & Southeastern.—Extended from Mount Vernon southeast to Evansville, Ind., 84 miles, of which 57 are in Illinois.

Shawneetown Division completed by the construction of the section between McLeansboro and Equality, 25 miles.

Chicago, Danville & Vincennes.—Extended from St. Anne, 65 miles south of Chicago, south to Danville, 63 miles.

Cincinnati, Lafayette & Chicago.—Constructed from St. Anne southeast 45 miles, to a connection with the Lafayette, Bloomington & Mississippi at Templeton. Twenty-one miles are in Illinois.

Fairbury, Pontiac & Northwestern.—Track laid from Streator southeast to Fairbury, 30 miles.

Gilman, Clinton & Springfield.—Track laid from Gilman southwest to Springfield, 111 miles.

Springfield & Illinois Southeastern.—Track of northwestern extension laid from Springfield to Beardstown, on the Illinois River, 45 miles.

Southern Division extended from Edgewood northwest to a junction with the Vandalia road at Altamont, 11 miles.

Carbondale & Shawneetown.—Completed from Carbondale east to Marion, 17½ miles.

Quincy, Alton & St. Louis.—Completed from Quincy down the east side of the Mississippi to a point opposite Louisiana, Mo., 42 miles.

Springfield & Northwestern.—Track laid from Havana, on the Illinois River, southeast 26 miles to Petersburg.

Pekin, Lincoln & Decatur.—Extended from Delavan (20 miles southeast of Pekin) southeast 47 miles to Decatur. Leased to the Toledo, Wabash & Western Company.

Evansville, Terre Haute & Chicago.—The Illinois section, from Danville southeast six miles, was completed.

WISCONSIN.

There are numerous lines in progress in Wisconsin. An extension of the Sheboygan & Fond du Lac from Fond du Lac west through Ripon to Princeton is all or nearly all graded. The Manitowoc, Appleton & New London has its road-bed complete or nearly so from Appleton northwest to New London, and perhaps a little track laid, and considerable work done between Appleton and the lake shore at Manitowoc. The Milwaukee, Manitowoc & Northwestern (that, we believe, is the name) has a great deal of grading done along the lake shore between Milwaukee and Sheboygan, and was to have considerable track laid by this time. The Madison & Portage is grading a line from Portage north to connect with the Wisconsin Central. The Madison extension of the Chicago & Northwestern is progressing favorably toward La Crosse and Tomah; and the Wisconsin Central has a large amount of grading done, and is making every effort for an early completion of the line to Lake Superior.

Green Bay & Lake Pepin.—Track laid from Green Bay west to New London, 40 miles.

Wisconsin Central.—Constructed from Menasha, on the Chicago & Northwestern near the north end of Lake Winnebago, west by north 64 miles to Stevens Point, and grading for about 40 miles more completed.

Madison Extension of Chicago & Northwestern.—Track laid from Madison northwest to Reedsburgh, 55 miles.

Menomonee Extension of Chicago & Northwestern.—Constructed from Fort Howard, at the foot of Green Bay, northward along the west shore of Green Bay to Menomonee, 52 miles.

Fox River Valley Extension of Chicago & Northwestern.—Constructed from Genoa (close to the Wisconsin line) northwest 9 miles to Geneva.

Oshkosh & Mississippi.—Constructed from Oshkosh southwest to Ripon, 20 miles.

Sheboygan & Fond du Lac.—Graded from Fond du Lac west through Ripon to Princeton, 35 miles.

West Wisconsin.—Extended from Menomonee west to Hudson, 42 miles, completing the road.

Milwaukee & Northern.—Extended from Cedarburg, 20 miles north of Milwaukee, northward to a junction with the Sheboygan & Fond du Lac road at Plymouth, 32½ miles.

MINNESOTA.

Northern Pacific.—Track extended from a point about 40 miles east of the crossing of the Mississippi, at Brainerd, west by north to the Red River of the North at a point called Fargo, 178 miles, completing the line across Minnesota.

St. Paul & Pacific.—Extended from Benson northwest to the Red River of the North at Breckenridge, 72 miles.

St. Paul, Stillwater & Taylor's Falls.—Constructed from St. Paul east to the St. Croix River, 18 miles, affording the entrance into St. Paul and the Minnesota section of the West Wisconsin Railway.

St. Paul & Chicago.—Completed by the construction of a section from Red Wing down the west bank of the Mississippi to Weaver, 42 miles.

Hastings & Dakota.—Extended from Fairfield (22 miles west of Hastings) westward to Carver, 20 miles.

Minneapolis & Duluth.—Constructed from Minneapolis northeast to White Bear Lake, 12 miles, connecting with the Lake Superior & Mississippi Railroad, which has leased and is operating it.

Minneapolis & St. Louis.—Completed from Minneapolis southwest to Carver, 28 miles. Leased by the Lake Superior & Mississippi company.

Sioux City & St. Paul.—An extension of the St. Paul & Sioux City Railroad, completed from St. James, the terminus of the latter road, southwest 56 miles to Worthington, near the Iowa line.

Winona & St. Peter.—Extended from St. Peter west to New Ulm, 25¼ miles.

IOWA.

Most of the grading has been done for a branch of the Chicago, Rock Island & Pacific road from Washington west to Sigourney, and as far as Baden, 20 miles, is to be ironed directly if it is not already. A great effort will be made to complete the Chicago, Dubuque & Minnesota road very soon as far north as Lansing, and the Chicago, Clinton & Dubuque, which is virtually a southern extension of the same road, is ready or very nearly ready for the rails all the way to Clinton, where it will connect with the Chicago, Burlington & Quincy road through its new line from Clinton to Mendota. The Iowa Southwestern has also made considerable progress during the year, and plans are made for new lines across the State from Muscatine west and between the east and west lines of the Illinois Central and the Milwaukee & St. Paul.

Chicago & Southwestern.—Extended from Drakeville to the Missouri line, 53 miles, completing the part of the road in Iowa. Leased and operated by the Chicago, Rock Island & Pacific.

Des Moines & Indianola.—Track laid from Des Moines south to Indianola, 20 miles.

Chicago, Clinton & Dubuque.—Completed from Dubuque down the Mississippi to Tete des Morts River, 14 miles.

Chicago, Dubuque & Minnesota.—Completed from Dubuque up the Mississippi to a point a few miles above McGregor, about 60 miles.

Iowa Midland.—Extended from Maquoketa westward to Anamosa, 33 miles.

Sabula, Ackley & Dakota.—Extended from Preston westward to Delmar, the junction of the Iowa Midland and Davenport & St. Paul roads, about 13 miles.

Burlington, Cedar Rapids & Minnesota.—Extended from Cedar Falls northwest to a junction with the Austin & Mason City line of the Milwaukee & St. Paul at Plymouth, 67 miles. Track was laid for about five miles of the line south of Cedar Rapids early in the year.

Burlington & Southwestern.—Track laid from its junction with the Chicago, Burlington & Quincy, 25 miles southwest of Burlington, west 61 miles to Bloomfield, on the North Missouri, the track of which it uses to Moulton, 14 miles further west.

Davenport & St. Paul.—The main line was extended from the point of junction of the Maquoketa Branch, 12 miles north of Davenport, northwest 60 miles.

Central of Iowa.—Extended from its late northern terminus at Mason City due north 25 miles to Northwood, near the Minnesota line. About 10 miles of the line south of Grinnell was ironed very early in 1871.

Creston, Bedford & St. Joseph.—A branch of the Burlington & Missouri River Railroad, constructed from Creston southwest 40 miles to a connection with the Maryville Branch of the Kansas City, St. Joseph & Council Bluffs Railroad at Hopkins, on the Missouri border.

NEBRASKA.

Atchison & Nebraska.—Extended from the Kansas State line north five miles to Rulo, and from a point ten miles west of Rulo northwest to a point a few miles beyond Arrow Rock, 41 miles.

Burlington & Missouri River.—Extended from a point three miles west of Lincoln southwest 17 miles to Crete and thence westward toward Kearney 48 miles.

St. Joseph & Denver City.—About ten miles of the extension of this road, from Fairbury southeast to the Kansas line, is in Nebraska.

Omaha & Southwestern.—Extended from Crete (which place its trains reach by using 66 miles of the track of the Burlington & Missouri River road from Omaha junction) southward 30 miles to Beatrice.

Midland Pacific.—Track laid from last year's terminus (about 10 miles west of Nebraska City) west 47 miles to Lincoln.

Omaha & Northwestern.—Extended from a point about 15 miles north of Omaha northward to Blair, 14 miles. It runs trains from Omaha to the terminus of the Fremont, Elkhorn & Missouri Valley road at West Point, reaching it over the track of the Sioux City & Pacific between Blair and Fremont, 24 miles.

Fremont, Elkhorn & Missouri Valley.—Extended from a point 21 miles north of Fremont, its southern terminus, northward 15 miles to West Point.

MISSOURI.

The grading is completed, or very nearly so, on the Quincy, Missouri & Pacific as far west as Edina, 51 miles, and contracts have been let for 45 miles more. The 18 miles of track reported was laid before the end of November, since which time we have had no report of further extension. This is one of the most important lines in Missouri. Before the close of the season the Mississippi Valley & Western had its road-bed ready from Keokuk south to Canton, the northern terminus of its completed line from West Quincy. The Burlington & Southwestern is grading for a continuation of its line to St. Joseph. A large amount of grading has been done on a line from St. Girardeau southwest, and a contract has been let for the construction of the Laclede & Fort Scott road across the southern half of the State, and a considerable amount of grading is done for the Kansas City & Memphis line.

Missouri, Iowa & Nebraska.—Completed from Alexandria west 53 miles.

Hannibal & Central Missouri.—Track laid from Hannibal west to a junction with the North Missouri at Moberly, 70 miles. Leased and operated by the Toledo, Wabash & Western.

Louisiana & Missouri River.—Extended from Bowling Green (9 miles west of Louisiana) westward to a junction with the North Missouri at Mexico, 39 miles.

The Jefferson Branch was completed from Mexico southwest to Concord, 12 miles.

Chicago & Southwestern.—Completed by the extension from the Iowa line southwest to Cameron, 101 miles. Leased and operated by the Chicago, Rock Island & Pacific.

Quincy, Missouri & Pacific.—Track laid for 18 miles west of West Quincy.

St. Louis, Council Bluffs & Omaha.—This branch of the North Missouri was extended from Chillicothe northwest to Pattonsburg, 42 miles.

Atlantic & Pacific.—Extended from Neosho southwest to Vinita, Ind. T., 50 miles, 16 miles being in Missouri.

Lexington & St. Louis.—Track laid from Sedalia, on the Missouri Pacific, northwest to Lexington, on the Missouri River, 55 miles. Leased to the Pacific of Missouri.

St. Louis, Lawrence & Denver.—The whole line completed from Pleasant Hill, on the Missouri Pacific, 34 miles southeast of Kansas City, west by north to Lawrence, Kan., 58 miles. The length in Missouri is 22 miles. Leased and operated by the Missouri Pacific.

Missouri, Kansas & Texas.—Osage Division completed from a junction with the Missouri Pacific at Holden westward to the Missouri River, Fort Scott & Gulf road at Paola, Kan., a distance of 54 miles, 40 miles being in Missouri.

St. Louis & Iron Mountain.—The Arkansas Branch was extended from Pilot Knob south to Piermont, 40 miles.

KANSAS.

St. Joseph & Topeka.—Constructed from the St. Joseph & Denver road at Wathena (6 miles west of St. Joseph) southwest to the Atchison & Nebraska Railroad at Doniphan, 13¼ miles.

Atchison, Topeka & Sante Fe.—Extended from Emporia westward to Newton, 74 miles. Road-bed completed from Atchison to Topeka and about ten miles of track laid. Contract let for and work commenced on extension from Newton westward up the valley of the

Arkansas, 115 miles. Grading completed for branch from Newton south to Wichita, 25 miles.

St. Louis, Lawrence & Denver.—Completed from Lawrence east by south to Pleasant Hill, on the Missouri Pacific 34 miles southeast of Kansas City, a distance of 58 miles ; 36 miles in Kansas.

Leavenworth, Lawrence & Galveston.—The main line was extended from Thayer southwest to the Indian Territory line at Coffeyville, 33 miles, and a branch has been constructed from Cherryvale west to Independence, 10 miles.

Missouri, Kansas & Texas.—Track laid on Sedalia Division from Fort Scott southwest to a junction with the Neosho Division at Parsons, 49 miles.

Of the Osage Division, from Holden westward to Paola, constructed in 1871, 14 miles is in Kansas.

St. Joseph & Denver City.—Extended from Maryville northwestward to Fairbury, Neb., 40 miles ; about 30 in Kansas.

INDIAN TERRITORY.

Missouri, Kansas & Texas.—Track laid from the Kansas line near Chetopa southward to the Arkansas River near Fort Gibson, 87 miles.

Atlantic & Pacific.—Completed from the Missouri line at Seneca westward to a point two miles beyond Vinita, 37 miles.

COLORADO.

Denver & Rio Grande.—Completed from Denver south to Colorado Springs, 76 miles. It has a gauge of 3 feet.

NEVADA.

Virginia & Truckee.—Extended from Reno through Steamboat Springs toward Carson, 16 miles.

WASHINGTON TERRITORY.

Northern Pacific.—Completed from the Columbia River at Kalama northward 25 miles.

CALIFORNIA.

California & Oregon.—This branch of the Central Pacific was extended from Sesma northward to Red Bluffs, 11 miles.

San Joaquin Valley.—This branch of the Central Pacific has been extended from Modesto southward to Bear Creek, 36 miles.

Southern Pacific.—Extended from Gilroy northward to Hollister, 14 miles.

Gilroy & Watsonville.—A branch of the Southern Pacific; completed from Gilroy southwest to Pajaro Valley, 20 miles.

Stockton & Visalia.—Complete, from Stockton southeastward 18 miles. Leased to the Central Pacific.

OREGON.

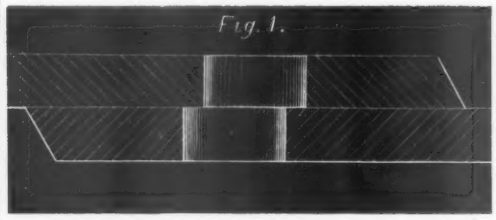
Oregon & California.—Extended from Albany (81 miles south of Portland) southward to Cresswell, 55 miles.

BOILER CONSTRUCTION.

In the RAILROAD GAZETTE of August 12 we published some considerations on the strength of boiler seams and on the effects of punching on boiler plates. It was shown in that article that the strength of a single riveted seam is only 45½ per cent. of that of the sheet itself, and that by drilling the holes, the strength of the seams could be increased to 65½ per cent. of that of the sheet. When we reflect upon the heartrending disasters, the wasted lives and desolated homes which are the results of the ever-recurring boiler explosions, it would seem that, if what we then undertook to show is susceptible of demonstration, unless there is some insurmountable difficulty in the way of drilling such plates, it should be a criminal offense ever to construct a boiler of punched sheets. What we then stated is not only susceptible of demonstration, but the conclusions can easily be verified by experiment, so that those who are skeptical can have no room for doubt. The Committee of the Master Mechanics' Association to which the subject of boiler construction was referred could therefore do no better service to the public than to try some experiments either verifying or disproving the statements which have been made regarding this matter. Such experiments have been repeatedly tried in Europe; but if repeated and amplified here, they would have more weight and influence with engineers generally in this country than the experiments made on the other side of the Atlantic have thus far exerted on American practice.

Besides the weakening of the plate by the strain to which it is subjected in punching, there is always a degree of uncertainty about the strength of seams made of punched plates, which must be a fruitful cause of weakness and consequent disaster. Every person who has made even the most casual observation in a boiler-shop knows that the holes of two plates which are punched separately never correspond *exactly*, and very frequently they come all awry, and must be reamed out, or else the plates are strained by driving in a drift to force them into position, in order to bring the holes near enough over each other, so that the rivets will enter. That they do not fill the holes when the plates are in such a position will be distinctly shown if a seam be planed through the center line of the rivets. It will be remembered by some of our readers that we published an engraving of such sections in the GAZETTE of August 12, and that some of the rivets which were represented came very far from filling the holes. We will suppose now that some of the holes in two plates come in relation to each other as they often do, as we have represented in the section, fig. 1. In such an event, it will be almost impos-

Fig. 1.



sible to make the rivet fill the holes unless the latter are reamed out very much larger than the size they are punched. If this is done, unless a larger sized rivet is used, it will be as difficult to get it to fill the holes as it would be if they were not reamed out. Of course, if the holes are reamed out so that they will correspond accurately with each other, by using larger rivets the latter can be made to fit accurately, but entire dependence must be placed on the faithfulness of the workmen employed to do this—a reliance the uncertainty of which only those who have had experience know, and which, we regret to say, of late years seems to be growing more so. Now the fact that workmen *could* do good work if they would does not lessen the danger from this source. In making boilers of punched plates there is always a risk of bad workmanship, and, what is worse, it is always out of sight and therefore undiscoverable.

With sheets carelessly punched there is also danger that some of the rivets will be subjected to an undue strain. If, for example, we have five rivets, as shown in

Fig 2.

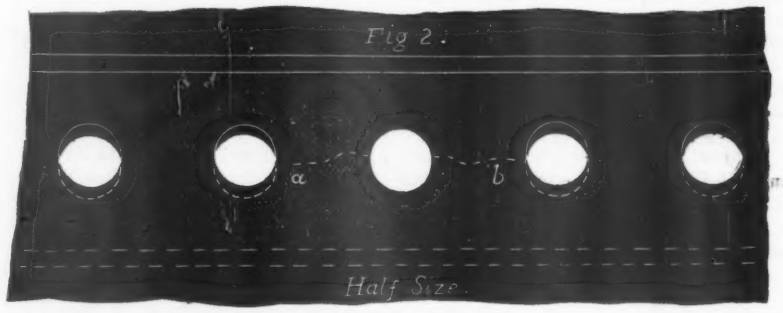
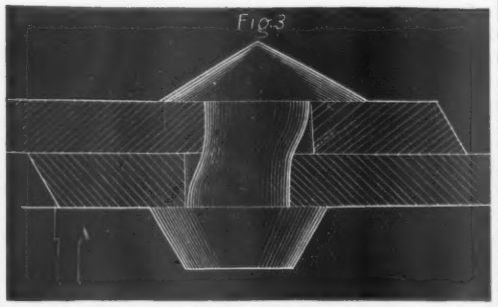


fig. 2, of which only the center holes correspond with each other, and consequently are the only ones which are fitted accurately by a rivet, all the others will fill the

Fig. 3



holes probably somewhat as represented in fig. 3, or as in figs. 4 and 5, which were taken from an old boiler. Now if the middle rivet in fig. 2 should fit accurately while all the others were as shown in fig. 3, 4 or 5—which probably frequently does occur—then the center rivet must bear all the strain until the others are drawn up to a bearing. There would, of course, under such circumstances, be very great danger of shearing off the rivet or of starting a fracture in the sheet as indicated by the dotted line *a, b*, between the adjoining rivets. When once started the constant expansion and contraction from the strain in the boiler would of course have a tendency to increase it, until there would not be sufficient strength left to resist the steam pressure, and a mysterious (?) explosion would result.

Just so long as boiler-plates are punched will the difficulty of getting the holes to correspond with each other and the danger from bad workmanship exist. If this difficulty and danger are entirely overcome by drilling instead of punching, and if, at the same time, those portions of the plates left between the holes are 30 per cent. stronger, it would seem that boiler plates should always be drilled instead of being punched, unless there are some insuperable difficulties in the way of doing so. Such, fortunately, is not the case, and that they have been very much exaggerated and the expense overestimated, we feel quite sure. Supposing, however, this were not the case, and that with the present appliances the cost of a boiler would be very much increased by the expense of drilling, how long would it be before some ingenious mechanic would devise the requisite means to cheapen the work and lessen the labor of doing it if there were a demand for such appliances.

The objections which have been urged against drilling boiler plates are, first, the expense, which we think can-

FIG 4

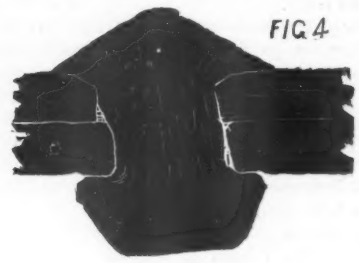
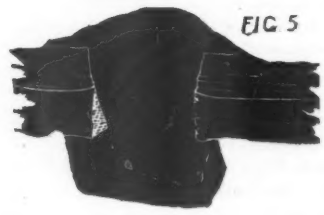


FIG 5

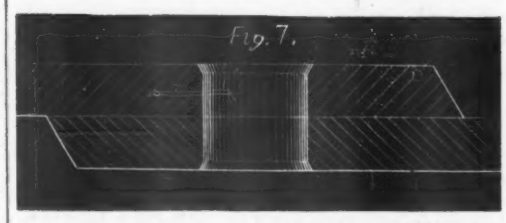


not be sufficiently great to outweigh the reasons in favor of doing so, especially when human lives are placed in the other balance. It is also said that if the two plates to be riveted together are drilled separately, there will be just as much difficulty and danger in getting the holes to correspond as there would be if they were punched—which is perhaps true—and that if the two plates are drilled together the drill will make a "burr" between them, which prevents their being brought together so as to be water and steam tight. Both these difficulties can be overcome by drilling one of the plates separately, and then placing it in the proper position on the second, and drilling the latter from the first. Care must be taken, of course, to drill the first plate from the side on which the other one laps, so that the "burr" will be on the outside, as shown in fig. 6.

Fig. 6.

If now the second plate be drilled from the first, the burr from the second hole will also be on the outside of the lap, and therefore both can be easily removed by a hand-drill, so that the holes in both sides will have a slight countersink as shown in Fig. 7. These would be

Fig. 7.



filled up by the rivets, and thus add materially to the strength of the latter at their weakest point.

With the holes drilled in this way, they would always conform exactly with each other even with careless workmanship, so that the danger to which we are always liable with boilers whose rivet-holes have been punched—that of having an undue strain fall upon some of the rivets—would be obviated, and at the same time the metal left between the holes would have more strength

than if they were punched. We also pointed out in a previous article that as the rivets will fit more perfectly in drilled holes than in those which are punched, the danger of leakage around the rivets is to a great extent obviated, and therefore they can be spaced further apart without incurring any danger of leakage. More metal will thus be left between the holes; and as the sectional area of a rivet increases as the square of the diameter, by a very slight increase of their size they will have as much strength as the drilled plates.

With steel plates the objections to punching are even greater than with iron. On some of the German railroads it has even been found necessary to drill the holes in steel rails to receive the fish-bolts, as it was found that they were exceedingly liable to be fractured in punching. Some experiments tried by the Boston Iron and Steel Company, in England, showed an average strength of 36.33 tons per square inch for drilled steel plates, and only 24.33 tons for those which were punched. Another experiment gave 42.9 tons for drilled plates and 39.11 for those punched. Should steel come into general use for boiler construction, it seems probable that drilling the plates will become a necessity.

In a future article we expect to have something to say with reference to spacing rivets and different kinds of boiler seams.

PATENT LUNACY.

To those of our readers who have charge of any of the departments of railroad management it will not be necessary to explain what we mean by the above title. All such have too often been the victims of those afflicted with this mental idiosyncrasy not to recognize the disease to which we refer. It is a sort of abnormal condition of the judgment which incapacitates the sufferer for seeing, in its true relations, what has originated in his own brain. It seems to be partly the result of long pondering over the profits which would result from a successful and valuable invention, until, in the eagerness to realize such advantages, he blinds his own eyes, stiffens his neck and, for aught we know, hardens his heart against impressions and evidence of which the bearing would be at all adverse to the realization of his dreams. Of course this state of mind often originates from gross ignorance, combined with an unwillingness to learn the truth, which latter is one of its most marked characteristics.

The last thing which such persons ordinarily are willing to do, is to study the subject on which they have been exercising their inventive faculties. If it is a car coupler, they ordinarily know nothing about the difficulties attending the operation of coupling. If it is a new and improved fire-box, they are ignorant of the laws of combustion; and when this class of people devise bridges, they are as oblivious of the science of statics as though it were not an element of sufficient importance to be taken into consideration.

There is no more melancholy sight than a man afflicted with this mania—which in many of its aspects closely resembles the passion for gambling—who is poor and dependent upon his daily exertions for the support of himself and family. He has constantly before him the vision of affluence, and with it the pangs of poverty. Experience teaches often in vain, and one failure only seems to gild the brighter the next vagary of invention. We know of men who for years have spent all the time and money they could control to develop and bring into use inventions which it was quite easy to demonstrate would be practically useless. These same men, if remonstrated with for thus following a constantly losing career, are always ready to justify themselves by citing the great inventors whose beginnings were equally discouraging and whose ultimate success was nevertheless most brilliant. Alas! if those who reason thus would only study, among other things, logic, so that they might see that because some inventors were in the beginning poor and had a hard time generally, but succeeded in the end, it does not therefore follow that *all* who exercise the inventive faculties in the midst of penury will emerge ultimately into success and affluence.

This passion is stimulated, too, by patent agents interested only in their fees. Like the lotteries of old, the prizes are printed in prominent type, but of the blanks no notice is made. Successful inventions are heralded, just as in the early California days the name of every finder of a big nugget was chronicled, while those who left the mines in poverty and want received no notice.

No more disagreeable duty falls to the lot of mastermechanics and mechanical editors than that of expressing opinions regarding new inventions. Their number is legion, and the man with a model under his arm and his pocket filled with letters and circulars is well known. There are some problems and inventions to which such men seem to be especially attracted. Among these are car-couplers, brakes, balanced-valves, car-seats, spark-arresters and ventilators. All master-mechanics know the depressing sensation which comes over them when one of the class we refer to presents himself with the sort of half-timid way which they often have. It is not a pleasant thing to do to tell a man his invention is good for nothing; and yet, in order to tell the truth, that is just what in effect must be said. It requires much skill and more patience not to wound such men's feelings, and yet it is often best for all parties to tell the plain truth, no matter how much it may hurt to hear it. Of course, to a busy man, overworked and loaded down with care and responsibility, many of these men become vampires of vitality. They suck the nervous energy and life out of him, and an interview with them is often as exhausting as a fast-day.

Of course in what we say we have no intention of throwing any disrepute upon what we might call legitimate inventors—those who possess what we might call prescient common sense, and who by close study, observation, experience, and above all by sound deductive reasoning, acquire a sort of prophetic power. They are a class to whom civilization owes much—a class with whom all right-thinking engineers and mechanics esteem it a privilege to have intercourse. Such men are accustomed to think accurately and conscientiously and to the purpose, instead of letting their minds wander in mere desultory impressions.

It is a very curious fact that many people—capitalists especially—have an impression that invention and mechanical design are somehow outside of the range of the reasoning faculties, and that it is a sort of inspiration or afflatus which comes over a man in an inexplicable way, and that probably the less common sense or wisdom a person may have regarding other matters, the better must he be as an inventor. Many who have entertained such impressions have had bitter reason to mourn that they based their faith on so insecure a foundation. The successful application of an invention requires, in fact, an exercise of the reasoning faculties quite as much as or perhaps more than a lawyer's argument in court; and the conclusions of the inventor should be as carefully sustained by evidence as is the lawyer's case.

All railroad officers know the class of inventors who, for some reason, have abandoned the exercise of common sense; who claim their inventions are worth millions; who imagine themselves the victims of a deep-laid conspiracy to prevent the use of their schemes; whose whole energies are engaged in getting up "stock companies," in which a *small* amount of stock is still untaken; who will make it to the advantage of the persons interviewed if they will help to "introduce" the invention; and who have letters from the King of the Cannibal Islands and all his princes to recommend their schemes. We know these men often to our sorrow. We also know those who have neglected their legitimate business and injured their future prospects, simply through a sort of mental inefficiency in not being able to see how inadequate were their means for the accomplishment of the ends proposed. In a very large majority of cases, we believe that to make an invention, or secure a patent for one, is a positive injury to the person to whom it is granted, both to his own character and in the estimation of others. The effect upon character is closely akin to that produced by the passion of gambling. It presents uncertain but brilliant possibilities, so that taste for sober work is apt to flag and neglect of important duties likely to follow. Those who have property in the shape of railroad or other equipment are slow to place it in the hands of any person on whom the suspicion of being a "visionary schemer" rests, and when we consider the extremely small number of patents of all that are granted which pay even expenses, it would seem that such property must generally have very little intrinsic value. The risks and expense of litigation must also be taken into account, so that the prospect of realizing any profit is in nearly all cases extremely small. Our advice, therefore, to all—young men especially—is to give their time and all their energies to their legitimate business.

There is always enough to be learned of any trade or profession to occupy all the spare time a mechanic or young engineer may have at his disposal, and time thus spent is *sure* to yield a return; whereas dreaming of vague possibilities, in the great majority of cases, brings nothing but disappointment. We do not, of course, wish to convey the impression that no one should ever devote himself to new discovery; what we wish to impress now is, that ordinarily a young man, with his career and reputation to make, cannot afford to spend his time or take the risks of success in this field. There is nothing which will aid a young man so much in life as to establish the reputation of being *reliable;* that is, that he is not prone to make mistakes, nor to come to conclusions hastily nor without sufficient evidence, and that his judgment may be relied upon. Our advice to such, therefore, is to avoid the allurements of "patent lunacy" until they are able to spare the time and money which is almost sure to be wasted before any return is made for their exertions in this field.

Book Clubs.

A correspondent who requests us to withhold his name writes us from Lawrence, Kansas, as follows:

"I have long felt the want of good mechanical books for reference, but have been unable to get many. The plan of a circulating library, sustained by monthly allotments from the employees of the road, will place many valuable works not only in my reach, but in the hands of all the men in the employ of the company.

"Our present plan is to have each man that is willing to become a member of the association allow the treasurer of the association to reserve from his pay an amount not to exceed one dollar and not less than ten cents each month. The amount that each man contributes is to be determined by himself.

"The most of the money of the association is to be used in the purchase of books of a good character—books that will elevate the men.

"We propose to have two rooms, one to be used as a library, the other as a sitting and reading room, where we shall keep on file daily and weekly papers and some of the better monthly publications. We can't put much money in this matter, as we are now young—just starting—and want to fill our library as fast as possible.

"We have every reason to think the enterprise will be a success, as our Superintendent is willing to grant all that we have asked of the company."

The plan proposed is undoubtedly a very good one, and is being very generally adopted, not only on railroads but elsewhere. Very few people who read can afford to purchase *all* the books to which it is desirable they should have access; but by co-operation they can of course accumulate a much larger store of literature, whether it be of a general or technical character. Such clubs should, however, exercise care in the selection of books, otherwise they will be apt to expend their money and get no adequate return for it. It is hardly ever safe to select books either from their titles alone or from the advertised notices of them. A library for railroad men should be selected by some one who has some knowledge of the wants of such people, and also of the books to be bought. It cannot be impressed too much on the minds of persons whose range of reading and study is limited that the difference in the *quality* of books is greater than that of almost any other material thing. Some are good, wholesome and nourishing, and the mind grows strong and healthy by such food. Others are mere trash and with as little nutrition for the mind in them as there is in the bark of a tree for the body. Others still are poison, or mere dirt and filth, and as injurious mentally as such food is physically.

Errata Wanted.

In the long article in this number entitled "Railroad Construction in the United States in 1871," there are doubtless errors of omission and commission. We will be much obliged to those who have accurate knowledge of the amount of track laid in 1871, which they see misstated there, if they will send us a corrected statement.

General Railroad News.

TRAFFIC AND EARNINGS.

The Marietta & Cincinnati earned $169,820 in December, 1871, which is $27,442 more than the earnings for December, 1870, an increase of 19¼ per cent.

ELECTIONS AND APPOINTMENTS.

—At a recent meeting of the Chicago, Clinton & Dubuque Railroad Company, the following gentlemen were elected directors: J. K. Graves, J. A. Rhomberg, R. E. Graves, D. Rhomberg, George A. Marsh, F. E. Hinckley, Wm. Andrew, L. D. Randall, Peter Kiene. At the subsequent meeting of the directors, the following gentlemen were elected officers: President, J. K. Graves; Vice President and General Superintendent, J. A. Rhomberg; Treasurer, R. E. Graves; Secretary, Peter Kiene; General Freight and Ticket Agent, Gen. C. H. Booth.

—The directors of the Manhattan & Northwestern Railroad Company have chosen Maj. N. A. Adams President and Managing Director; J. D. Brumbaugh, of Marysville, Kan., Attorney; A. L. Mortimer, Chief Engineer. S. D. Houston and I. T. Goodnow, of Manhattan, and J. D. Brumbaugh, of Marysville, succeed Messrs. Higginbotham, Pinkerton and McLaughlin in the directory.

—At a meeting of the stockolders of the Niles & New Lisbon Railway Company, held January 1, 1872, the following were chosen directors: C. H. Andrews, Youngstown, O.; W. C. Andrews, Cleveland, O.; H. F. Sweetser, Meadville, Pa.; S. L. M. Barlow, Charles Day, James B. Hodgskin, New York; C. W. Bradley, Niles, Ohio.

Messrs. Sweetser, Barlow and Hodgskin, of this board, are also directors of the Atlantic & Great Western Company, and Mr. Charles Day is Secretary of that company.

—Under date of Jan. 1, Mr. A. A. Talmage, General Superintendent of the Pacific Railroad of Missouri, announced the following appointments, to take effect that day: J. T. Redmon, Superintendent East Division, headquarters, St. Louis; A. W. Dickinson, Superintendent West Division, headquarters, Kansas City; E. B. Gibbs, Master Mechanic, headquarters, St. Louis, R. M. Peck, Superintendent Bridges and Buildings, headquarters, Franklin.

—At the annual election of the Richmond, Fredericksburg & Potomac Railroad Company, held in Richmond December 19, Mr. P. V. Daniel, Jr., was unanimously re-elected President, but, declining, John M. Robinson was chosen in his place. The other directors chosen were: R. W. Haxall, C. S. Mills, Elihu Chauncey and H. A. Claiborne.

—At the annual meeting of stockholders of the Cleveland & Pittsburgh Railroad, held at the office of the company in Cleveland, January 2, the following Board of Directors for the present year were elected: Thomas A. Scott, Philadelphia; George W. Cass, Pittsburgh; B. F. Jones, Pittsburgh; J. N. McCullough, Pittsburgh; R. P. Ranney, Cleveland; Jay Gould, New York; Henry N. Smith, New York; William Hoge, New York; Charles Lanier, New York; George B. Roberts, Philadelphia; J. V. Painter, Cleveland; William Thaw, Pittsburgh.

—At the annual meeting of the Richmond, Danville & Piedmont Railroad Company, in Richmond, December 19, Colonel A. S. Buford was re-elected president of the company, and the following directors: A. Y. Stokes, H. H. Marshall, John R. Edmunds, William T. Sutherlin and W. L. Owen. The following persons were chosen as an examining committee for the approaching year: W. B. Isaacs, Thos. D. Neal, Wood Bouldin, Jr., W. T. Scott and R. V. Gaines.

OLD AND NEW ROADS.

Chicago & Rock River.

Writing from Amboy, Ill., under date of Jan. 2, a correspondent says:

"This company have twenty miles of their road completed and in operation from Amboy, on the Illinois Central Railroad, to Rock Falls, on the Rock River, opposite Sterling, and by the first day of April next they will have 25 miles more in operation, the grading being nearly completed for that distance east from this point.

"It is the design of the company to complete the balance of the line east to intersect the lines of Eastern roads at Calumet, and from thence into Chicago, early the coming summer.

"This road, when completed, will give the most direct route from the East to the West. At Rock Falls it will connect with the Rockford, Rock Island & St. Louis Railroad, making a route from Chicago to Rock Island twenty-five miles shorter than by any other road. It also connects at Rock Falls with the Chicago & Northwestern for Omaha and the Far West.

"At a meeting of the stockholders, held at Rock Falls, Dec. 30 last, the following-named gentlemen were elected directors for the ensuing year: A. P. Smith, A. Wheeler, Rock Falls; Judge A. Kinyon, Amboy; O. P. Johnson, Malugens; Wm. Hanley, Lockport; J. S. Meckling, F. D. Gray, C. T. Bowen, C. G. Wicker, J. H. Wicker, Chicago. After which the board organized and elected the following gentlemen as officers for the ensuing year: Judge A. Kinyon, President; A. P. Smith, Vice-President; C. G. Wicker, Treasurer; James Rosebrough, Amboy, Secretary.

"The business talent and ability combined in this board bespeaks for the enterprise a sure and complete success."

Northeast Pennsylvania.

A correspondent writes:

"The graduation and masonry of this road between Hatboro and the junction with the North Pennsylvania Railroad at Abington are rapidly approaching completion. Track-laying will commence in the spring, and it is expected trains will run to Hatboro by the 4th of July, 1872. This road will be of great convenience to the people of one of the richest sections of the State of Pennsylvania, who have long felt the need of railroad facilities. At the annual meeting of stockholders, held at Hatboro on January 8, 1872, G. J. Mitchell was re-elected President, with about the same Board of Directors as last year."

Railroads in Northeastern Nebraska.

A correspondent, writing from Dakota City, Neb., says:

"While Southern Nebraska is rapidly obtaining railroad facilities, as yet no track has been laid in the northeast. At present there are three roads applying for bonds. A preliminary line has been run on the Sioux City & Columbus road. This road will give the rich country through which it passes, not only an outlet for its produce *via* Sioux City, but will bring from its Union Pacific connection at Columbus the Wyoming coal, and from Sioux City and St. Paul, Minn., lumber.

"The Omaha & Northwestern is in operation to the south line of Burt County, and located through the county, and awaits the vote of Dakota County to push their line to Dakota City, with the ultimate design of continuing their line up the Missouri Valley through Dixon and Cedar counties to the Nebraska.

"Through the latter part of the route, however, they have a rival in the Northern Nebraska & Dakota Central, in the interests of Sioux City, having its initial point at Covington, on the Nebraska side of the river opposite Sioux City. To isolate this road more completely from the railroad system of Nebraska, it is proposed that its gauge shall be three feet."

Boston & Albany.

The annual report for the year ending September 30, 1871, shows that the income was from passengers, $2,776,405.46; from freight, $4,747,180.21; from mails and other sources, $438,756.73; total receipts, $7,962,342.40. The expenses were $5,807,359.44, leaving a net balance of income of $2,154,982.06. Deducting from this interest, taxes and dividends, amounting to $2,148,475.84, there will remain an undivided surplus of $6,507.12, which, added to surplus at the beginning of the year, gives $2,397,012.71. Taking from this the dividend of December, 1870, payment to sinking fund last year, Pittsburgh & North Adams dividend, January, 1871, and claim against Grand Junction Railroad, amounting to $1,055,128.62, there remains a total surplus of $1,341,855.09. In reference to their debt the directors say: "To meet the sterling bonds which fell due on the first day of April last, the Commissioners of the Massachusetts sinking fund remitted to Messrs. Baring Bros. & Co., of London, all the available funds in their hands, the corporation arranging for any deficiency that might exist upon the final closing of the account. The Albany sinking fund is more than sufficient to pay the Albany bonds, $129,000 of which is now outstanding. These bonds, although not yet due, will be paid, principal and interest, on presentation to the Treasurer of the corporation. Of the dollar bonds, $692,500 due in 1875, are yet outstanding. These, with an obligation given to the State for the purchase, upon certain conditions, of fifty acres of the South Boston flats, constitute the entire present indebtedness of the corporation. The President says: "On the first day of May, before the passage of the Legislative act of May, and the day upon which the value of the stock is taken for the purpose of taxation, our shares were worth in open market $157¼. After the law was passed, and its full effect was understood by the shareholders, the shares sold down to $144. This fact serves to show one of the unfortunate workings of the law, affecting, as it does, not only the interests of the stockholder, but also those of the State at large, its assessable property having been thereby reduced over two millions of dollars. As before stated, the only alternative for raising money is by borrowing, and to meet engagements already made, we have been compelled now to go on to the market for a million and a half of dollars."

Central Pacific.

The financial agents of this company, Messrs. Fisk & Hatch, have issued the following comparative statement of its earnings since its first construction:

	Miles operated.	Gross earnings.	Net earnings.	Surplus of net earnings over int.
1864	18 to 36	$113 413	$46,871	$46,872
1865	31 to 56	401,941	280,273	178,161
1866	56 to 94	864,917	664,207	538,827
1867	94 to 137	1,421,525	1,087,901	810,761
1868	137 to 468	2,315,409	1,469,776	474,763
1869	468 to 742	5,716,115	2,591,497	1,507,147
1870	742 to 900	7,995,116	3,800,771	1,965,831
1871	900 to 1000	9,546,342	5,220,914	2,336,500
Total		$28,374,781	$15,162,201	$7,858,865

Iowa Railroad Land Company.

Mr. J. B. Calhoun, Land Commissioner of this company, late Land Commissioner of the Illinois Central, reports that the company's sales for the six months ending December 31 were 43,921 acres, providing 628 families with new homes in Iowa. The farms selected were generally in the middle region of Western Iowa and along the line of the Chicago & Northwestern and Illinois Central railroads.

New York Central & Hudson River.

Under date of January 1, W. H. Vanderbilt, Vice President of the New York Central and Hudson River Railroad Company, has issued the following general order:

"Notice is hereby given that the following changes of officers have occurred, consequent upon the consolidation of the accounts of the New York Central Railroad Company and the Hudson River Railroad Company.

"Mr. Edwin D. Worcester, for many years the Treasurer of the New York Central and latterly of the New York Central & Hudson River Railroad Company, has been appointed Secretary in place of Hon. Augustus Schell, resigned, and will be in charge of the general office, located at Albany. The care and custody of the important records of the company have been confided to him.

"Mr. Charles C. Clarke has been appointed Treasurer, in place of Mr. E. D. Worcester, resigned, and Mr. Chas. Wendell has been appointed Assistant Treasurer. All communications relating to this department to be addressed to the Treasurer, at Grand Central Depot, New York.

"Hon. Henry R. Pierson, one of the directors of the company, will have entire charge of all real estate, together with the rentals of the same, and the taxes and assessments thereon. Mr. A. Thayer, Jr., and Mr. F. A. Utter have been selected as his assistants. Communications relative to real estate to be addressed to Mr. Pierson, at Albany.

"Mr. Isaac P. Chambers, late Auditor of the Hudson River Railroad Company, has been transferred to the President's office. He will have charge of matters pertaining to the executive department, and is authorized to require such information and reports from officers and heads of departments as may be necessary for the proper discharge of his duties.

"Mr. D W. Tuthill, late Auditor of the New York Central Railroad Company, has been appointed Auditor of the consolidated company, with Mr. W. W. Antsey as Assistant Auditor.

"Mr. Cornelius V. Deforest, the former Supply Agent of the Hudson River Railroad Company, has been appointed Supply Agent of the entire line, with Mr. M. H. St. John as assistant. Office at New York—Grand Central Depot."

Pennsylvania Railroads.

The Media *American* states that the Pennsylvania & Delaware Railroad, from Pomeroy to Delaware Bay, has now most of the grading and measuring completed. The same paper says: "The Wilmington & Western, connecting Wilmington with Oxford, Chester County, Pa., is progressing, and it is thought the grading will be completed by spring as far as Landenburg. The Oxford & Peach Bottom needs but $2,000 more to start it. The Lancaster & Reading narrow-gauge is awaiting a subscription of $5,000 per mile and the right of way. The Philadelphia & Chester Central, *via* Newtown Square, has many enthusiastic supporters, and it now looks as though the work would soon commence. A road of the usual gauge from Paoli, by way of Ridley Creek, touching at Media, to Chester, has been talked of, and such a bill may be presented by Mr. Cooper at the coming session of the Legislature; not, however, unless there is a fair prospect of building the road."

The Directors of the Mirimar Railroad Company, at a recent meeting, resolved to change the name of the corporation to that of the Harrisburg & Potomac Railroad Company.

The survey of the Berks County Railroad will be completed in about two months, and the work will then be put under contract.

The Pennsylvania Railroad Company contemplates building an immense round-house at Marietta, Lancaster County.

The trains on the Sunbury & Lewistown Railroad are now making connections with the trains on the Northern Central road.

Lake Shore & Michigan Southern.

The directors declared a semi-annual dividend of 4 per cent. on the 3d inst., both on the stock and the paid-up scrip, payable February 1. Transfer books closed on the 6th.

Pittsburgh, Wheeling & Kentucky.

Ohio County, W. Va., in which Wheeling is situated, voted on the 3d inst. in favor of subscribing aid to this railroad, which is one of the Pennsylvania's projects. Wheeling gave a majority of 3,000 in favor of the subscription, and the majority in the county was 1,500 in excess of the three-fifths vote required.

Canada Southern.

The Chatham (Ont.) *Banner* says: "The work of grading on the Canada Southern is still going on, notwithstanding the untavorable weather. Beside the grading, a large number of men are at work in Kent clearing the wooded portion of the line, and others are engaged in getting out timber for and erecting culverts and bridges. In fact, at no time during the summer has greater activity been shown in pushing forward the work than at present. At least two-thirds of the line in Kent is already graded; ere the spring all the chopping and clearing on the remaining portions will be finished; all the bridges and culverts completed, and the greater part of the ties delivered along the line. Present indications are that the roadway (in this section, at least) will be ready for the rails by the 1st of July, 1872. If the track laying is pushed as fast as the work already done, there is little doubt but the railway will be in running order long before 28th February, 1873, the time fixed in the charter for the completion of the road."

Rome, Watertown & Ogdensburg.

An effort is making to establish in connection with this railroad a line of barges for the lumber trade between Ottawa, Canada, and Cape Vincent, *via* the Rideau Canal, which it is believed would supply the cheapest possible transportation for the Ottawa River lumber to the chief lumber markets of New York. Its establishment, it is reported, depends on the deepening of the Rideau Canal.

Hamilton & Lake Erie.

The County Council of Hamilton, Ontario, has voted a bonus of $20,000 to this proposed road.

North Shore, of Canada.

The Quebec *Mercury* says: "All the employes of the North Shore Railroad Company have been discharged, the directors having quarreled among themselves as to the sharing of the spoils. These will be very small, as the banks have refused to make any further advances and M. Cauchon has crushed the enterprise."

Chesapeake & Ohio.

The recent annual report for the year ending Sept. 30, 1871, gives the following facts:

"The funded debt of the road secured by mortgage is $11,237,100; the amount of bonds issued for funded interest is $163,844.95; dividend bonds, $29,312; the floating debt, $1,234,906.11.

"The General Superintendent states that the earnings of the company from passengers, freight, &c., amount to $769,265.05; expenses, $476,256.62; net receipts, $290,008.43. The increase for the year is $91,939.78. There is also a decrease in the expenses of $138,182.41.

"The equipment consists of 37 locomotives, 15 first-class and 6 second-class passenger cars, 12 baggage, mail and express cars, 205 box cars, 55 stock cars, 124 flat cars, 20 gondola cars, 10 caboose and boarding cars, and 7 gravel cars; 100 freight cars have been purchased, and 50 freight, 61 dump, 6 gravel, 3 passenger and 1 mail and express cars have been built at the company's shop."

The President promises the completion of the uncompleted section between White Sulphur Springs and Charleston, 102 miles, by October.

Interoceanic Railroad of Canada.

A notice for an act to incorporate the Interoceanic Railroad of Canada is published in the *Gazette* of the Dominion Parliament. It authorizes the construction of a railway from a point at or near Lake Nipissing, or some other point in the Province of Ontario, to connect with the railway system of Canada to Fort Garry or Winnipeg in the Province of Manitoba, thence westerly through any pass of the Rocky Mountains in Canadian territory to Howe Sound or Burrard Inlet, or to some other point on the Pacific Ocean in the Province of British Columbia, with power to extend the said railway to Victoria or Nanaimo, or some other point in Vancouver's Island, and to cross the said Island to Barclay Sound or to such other point on the coast of said Island as may be found expedient, together with branch lines from or near Winnipeg River to the Lake of the Woods, and from Fort Garry or Winnipeg to Pembina or to any other point on the boundary line of the Province of Manitoba, so as to connect with the railway system of the United States of America, with power to build, own and operate steam and other vessels in all Canadian lakes, rivers and the waters lying between Lake Nipissing and the Pacific Ocean.

Wood's Hole Railroad.

This railroad, a branch of the Cape Cod Railroad, in Barnstable county, Mass., is progressing, and, it is said, will be completed next summer.

Northern Pacific.

It is reported that the Hudson Bay Company has leased docks and warehouses in Duluth, Minn., with the view of sending its traffic over the Northern Pacific Railroad.

Grand Trunk.

The town council of the town of Galt has made an agreement with the Grand Trunk Railway Company for the construction of the Doon Branch. The town will complete the road-bed and the railroad company put on the superstruction and run at least one train daily between Galt and Toronto.

Canadian Pacific.

The official *Gazette* of the Dominion Parliament has lately published a notice "for an act to incorporate the Canadian Pacific Railway Company, with power to construct a railway from the Pacific Ocean toward the Rocky Mountains, and from such points as may be selected east of the Rocky Mountains toward the Pacific Ocean, connecting the seaboard of British Columbia with the railway system of Canada; such railways to be constructed upon such route, and from such points as its eastern and western termini as shall be selected or approved by the Government of Canada, with power also to construct branch lines to the Sault Ste. Marie, to Fort William, to Pembina and to all such other points upon the frontier of the Dominion of Canada as may be deemed advisable; and also with power to construct or join in constructing a bridge across the Sault Ste. Marie, and to own and work steam and other passenger and freight vessels upon all lakes touched by such railway or its branches. Also for a charter for the construction of a railway from a point on Thunder Bay or Nipigon Bay, or a point between both bays on the north coast of Lake Superior to a point on Rainy Lake, and from thence to Fort Garry, in the Province of Manitoba, with power to build, own and operate steam and other vessels on Rainy Lake, Lake of the Woods and Lake Winnipeg and the waters between said lakes—the said railway to be built in sections, the first section to extend to a point on Rainy Lake, the second section to extend to a point on Lake Winnipeg, and the third section to extend to Fort Garry, with provisions for obtaining aid in its construction by land grants, money subsidies or guarantees from the Government of Canada and Provinces of Ontario and Manitoba; and with power to stipulate with immigrants and other parties in and out of the Dominion of Canada for the construction of the works of the said railway, and to settle them on the lands granted by the said governments. Signed—George Laidlaw, James Turner, Adam Brown, F. W. Cumberland, John B. Robinson, Archibald McKellar, William McGiverin, George Stephen, Angus Morrison, Thomas Dick, Charles McKinnon."

Freights Westward.

The following are the rates adopted near the close of the year on rail freights from New York to principal Western points. This is a considerable advance, but is about the usual winter tariff. The amount of the advance can be found by a comparison, the old rates being given on the right:

	NEW RATES.					OLD RATES.				
	Classes.				Spl.	Classes.				Spl.
	1.	2.	3.	4.		1.	2.	3.	4.	
Cleveland	$ .82	$ .72	$ .56	43c	33c	$ .66	$ .59	46c	36c	30c
Sandusky	.90	.79	.61	47c	36c	.73	.65	51c	40c	33c
Columbus	1.00	.88	.68	52c	40c	.81	.72	56c	44c	37c
Cincinnati	1.15	1.01	.78	60c	46c	.93	.83	65c	51c	42c
Louisville	1.39	1.23	.97	75c	59c	1.14	1.03	82c	64c	55c
St. Louis	1.58	1.40	1.10	85c	67c	1.29	1.16	92c	73c	62c
Cairo	1.60	1.41	1.09	83c	64c	1.29	1.15	90c	70c	59c
Toledo	.96	.85	.65	50c	39c	.78	.70	54c	42c	35c
Chicago	1.25	1.10	.85	65c	50c	1.00	.90	70c	55c	45c
Milwaukee	1.25	1.10	.85	65c	50c	1.00	.90	70c	55c	45c
Detroit	.88	.78	.60	46c	35c	.71	.64	50c	39c	32c

Burlington & Southwestern.

The first passenger train on this railroad to run through to Moulton made the trip on the 30th of December. Moulton is 100 miles from Burlington, but for 25 miles from Burlington the track of the Keokuk Branch of the Chicago, Burlington & Quincy Railroad is used, and from Bloomfield to Moulton, 14 miles, that of the North Missouri.

Chicago & Michigan Lake Shore.

The company intended to complete its extension from Montague to Pentwater by January 1, but the early closing of the lake and other causes have delayed the iron, and, with the track laid about half the distance, the completion of it is postponed until early spring.

Connecticut River.

The report for the year ending September 30 shows that the income of the road last year was $725,391, and the expenses $477,489, making the net earnings $247,901. These earnings, except the sum of $992, were disbursed in the payment of interest, taxes and two dividends, and an addition of $8,000 to the sinking fund. The corporation has a surplus fund of $217,102. The business of the road has been good, showing an increase of 6¼ per cent. over the previous year. The road and its equipment have been kept at a high standard. The bonded debt, amounting to $250,000, is provided for by a sinking fund, which now amounts to $117,755.37, and will probably equal the entire debt when it shall have matured.

The Pennsylvania in the South.

The Memphis *Appeal* publishes the following, which is something like what is said somewhere of almost every corporation in the country about once a year, and which the reader may trust or not, at his discretion:

"The Pennsylvania Central Railroad Company has agreed to indorse the bonds of Mahone's consolidated roads, extending from Norfolk to Bristol, that these may extend their connections to the Mississippi River, and ultimately to the Pacific. London and New York capitalists advance the funds required for the purpose. The fact that capitalists of these two cities make these advances justifies the conclusion that Mahone's plans are well and wisely defined. Whether he proposes to reach the West solely through Louisville and St. Louis, or will scale the Cumberland range, making Gen. Maney's Central or the Memphis & Charleston road parts of his line, is not yet known. In any event, Mahone has an abundance of money. Such is the story told by European papers. Scott, of the Pennsylvania Central, having paid $1,000,000 for 10,000 shares—a controlling interest—in East Tennessee roads, and having furnished Mahone, it is alleged, with facilities for money-getting, it is probable that the latter, in conjunction with Scott, will seek a route to the Mississippi either over Scranton's Chattanooga, Meridian & Vicksburg route, or over the Memphis & Charleston road to Memphis."

Boston Street Railroads.

The Boston *Journal* gives the following comparative statement of the average expenses per mile run by the several street railway companies owning tracks in the city of Boston, and the number of passengers carried per round trip for the year ending September 30, 1871, as appears by their sworn reports. The average expenses a mile have been as follows, viz.:

Metropolitan Railroad	33 1-3 cents
Middlesex Railroad	31 64-100 "
South Boston Railroad	35 "
Union (Cambridge) Railroad	32 30-100 "

Average number of passengers carried each round trip has been as follows:

Metropolitan Railroad	43
Middlesex Railroad	38 31-100
South Boston Railroad	46 17-100
Union (Cambridge) Railroad	41 71-100

The net income the past year on the several roads has been as follows:

Metropolitan Railroad	$132,192 or 10 56-100 per cent.
Middlesex Railroad	38,516 or 7 13-100 per cent.
South Boston Railroad	44,375 or 10 91-100 per cent.
Union (Cambridge) Railroad	25,049 or 12 50-100 per cent.

East New York & Jamaica.

This horse railroad was sold on the 2d inst. to satisfy the first mortgage of $67,000. It was bid in by Mr. Osborne, of the Brooklyn City Railroad, for $76,000.

Toledo, Ann Arbor & Northern.

Prof. S. A. Douglass, of Ann Arbor, the President of this company, reports that he will be prepared to let the contracts for the construction of the road in a few days.

Flint & Pere Marquette.

It is reported that the Pennsylvania Company will take this railroad under its wing, together with its new leased line, the Holly, Wayne & Monroe, and that a new road is to be constructed for it into Toledo from Monroe. The road now in progress from Toledo to Mansfield will serve as the connection with the Fort Wayne road.

Oil Creek & Allegheny River.

An exchange reports the following:

"A meeting of the stockholders of this company was held in Philadelphia on the 19th of December, for the purpose of considering and acting on articles of consolidation and merger of the Union & Titusville Railroad Company with the Oil Creek & Allegheny River Railway Company. The stockholders adopted the merger by a unanimous vote.

"The Oil Creek & Allegheny River Railway runs from Union along the Allegheny River to Oil City, from there to Petroleum Center, and up Oil Creek to Titusville, and thence to Corry.

"The Union & Titusville road runs from Titusville to Union, a distance of 25 miles, and there connects with the Atlantic & Great Western and Philadelphia & Erie Railroads, the road having three rails, thereby accommodating the wide and narrow gauges.

"The acquisition of the Union & Titusville Railroad, it is said, will enable the company to do business fifty per cent. cheaper than over the branch to Corry. The Pittsburgh connections with Buffalo occupy the Corry Branch. The Union connection affords direct communication with Erie and the lakes. The maximum grade is some forty feet to the mile less than the one running to Corry.

"The capital stock of the Union & Titusville Railroad is $700,000, bonded for $500,000. The dividends are to be the same as the Oil Creek Company, viz., ten per cent.

"This gives the Oil Creek Company nearly two hundred miles of single track. The passenger traffic on their road is $1,000 a day."

New Jersey Railroad Legislation.

The Trenton correspondent of the New York *Times* writes as follows of the legislation concerning railroads proposed in the present Legislature:

"The legislation of the session will cover a great variety of subjects, but the railroad interest will, as usual, absorb an undue share of attention. Among the projects which will early apply for legislative sanction is that of the construction of a coal road from Easton, on the Delaware, to Perth Amboy, on Raritan Bay. This enterprise originates with Asa Packer, who desires an all-rail route from his Pennsylvania mines to tide-water, in order that he may be independent of existing lines and able to defy all hostile combinations. Should a charter for such a road be framed, Mr. Packer would establish a vast coal depot at Perth Amboy, whence shipments could be made all the year round, without interruptions from ice or other obstructions. It is understood that the Pennsylvania Central, which now controls the consolidated railroads of New Jersey, will oppose this commendable project, but for what reason it is difficult to understand, since there can be no serious competition between any of their lines and that in contemplation. It is understood that the Pennsylvania Company will also oppose an application of the New Jersey Central road for authority to extend its Flemington Branch to the Delaware River. This branch runs through Somerset and Hunterdon, two of the richest agricultural counties of the State, but its value is very much impaired by the fact that it has no westerly or southern connections, enabling it to reach the Delaware, or communicate directly with Philadelphia. Application for its extension has been repeatedly made to the Legislature, but owing to the opposition of the Camden & Amboy monopolists, it has been found impossible to obtain the necessary authority. This year the attempt is to be renewed, but will be again opposed, on the ground that if the road is extended to the Delaware, it will be able to connect with a road, for which a charter has been obtained, running through Bucks County, in Pennsylvania, to Philadelphia, thus forming a through route in opposition to the present New York & Philadelphia line. Such would, very probably, be the ultimate result of the legislation asked for, but this is rather a reason why it should be granted than an argument for its denial. In the same connection it is rumored that another effort will be made to pass the Air Line Railroad bill, which was defeated last winter, and under which, if now passed, a direct line from Jersey City to Philadelphia would be immediately constructed, and so operated as to reduce the time between the two cities to two hours and a half.

"Another feature of this session of the Legislature will be the agitation of the repeal of all the Erie legislation of the past three years. This company, by the employment of 'arguments' peculiar to itself, has been able, latterly, to obtain everything it asked for in that State, riding rough-shod over all considerations of public interest and private right. Last year it secured the passage of a law which practically exempts it from all penalties for overcharges, and it may now indulge in any extortions whatever without fear of being called to account. It has also had enacted certain laws in reference to the taxation of its property in Hudson County, under which it escapes assessment upon millions of dollars' worth of depot, wharf and other grounds, which are properly liable to tax. The whole amount of tax paid to the State, last year, by this immense corporation, was less than $20,000. An effort is now to be made to repeal all this partial and vicious legislation, and the indications are that it will be successful, the managers being unable to make any combinations with the leaders of either party which will be of real service in a sharp and aggressive conflict such as is foreshadowed."

Canadian Railroad Policy.

In a letter on the new Canadian ministry, a Toronto correspondent of the New York *Times* says:

The defeat of the railway policy in the Legislature, it is thought, will produce an unfavorable effect upon all new enterprises. The new ministry have given a pledge that the engagements entered into between their predecessors and certain railroad companies, in accordance with the act, shall be respected; but no further aid will be given to other roads, unless each grant is sanctioned by the Legislature. This will necessitate a change of tactics on the part of the promoters of new schemes, and any amount of "log-rolling" will be the consequence. It is expected that there will be a fierce contest among the applicants for loans, soon after the Legislature reassembles. This legislative railroad war will be worse than the battle of the gauges which was fought between this city and Hamilton. Among the new projects now spoken of is a line to run from Hamilton to a point on the Georgian Bay, where it will intersect the Central Canada line, now in course of construction. By this route direct communication will be obtained with Montreal and Quebec, and the proposed road will also join the line now being surveyed to run to the Pacific. The scheme meets with much favor, and is being agitated with every probability of its success. It is another phase of the rivalry existing between two sister cities, Toronto being regarded as inimical to the interests of Hamilton, whenever it can have an opportunity of pushing forward any railroad project. The continuation of the Brantford & Harrisburg Branch of the Great Western Railway, which was opened last month, will be proceeded with before long, the preliminary surveys having been completed. The principal object in carrying the line in the direction of Lake Erie is to strike the Canada Southern or Loop line, which the Great Western Company are now building. A connection of this kind would be valuable to the Great Western, and therefore it is not intended to carry the branch to the lake, inasmuch as it would cross the rival Southern road, which is progressing so rapidly between the Niagara and Detroit Rivers. The importance of a line down the southern side of the Canadian peninsula has been considered so great as to induce the promoters of the Loop line to abandon their original intention and run it direct from Glencoe, on the Great Western, to the Niagara River, and for its accommodation a second bridge across the Niagara is talked of, as the one now in course of construction will not be sufficient for the wants of three roads. The completion of two southern lines will draw the through business of the Eastern and Western States by that route, thus rendering it imperative for this section of the country to secure as much benefit from these new roads as possible. With this view, the Hamilton & Lake Erie and the Brantford & Norfolk extension of the Harrisburg Branch are to be built. It is not a little strange that a section of country at present not served by railways is to become the great, if not the only highway for the traffic and travel which have for the past eighteen years found their way over the most extreme northern route. The cause, of course, is the shortening of the distance, which will be considerable. The two southern roads will also terminate at more convenient points on the Niagara River than the present one, which is twenty-five miles below Buffalo. This will be a great advantage in forming a more direct connection with the New York Central and Erie roads. At the western end one of the roads will connect with the Michigan Southern, thus securing two outlets at each end of the peninsula.

There is some talk of starting a nine-hour movement among the employes of the manufactories and railroads. At present some of them have the nine hours a day allotted to them, but they receive pay for only nine hours;

that is, such as were paid at the rate of one dollar a day when the time was ten hours, have had it reduced to ninety cents. The desire is to reduce the hours generally from ten to nine hours a day, and the pay to be the same as if ten hours were exacted. In making the time nine hours, it is considered that the mistake made in England in demanding eight will be avoided, as a compromise had to be submitted to there. How the movement will take it is difficult to say, but it should commend itself to thoughtful consideration where workmen are obliged to work nine hours a day in winter because of the shortness of the days.

The Council Bluffs and Omaha Bridge.

The following account of this bridge, which the Union Pacific Railroad Company is constructing, is contained in the report of T. E. Sickels, Chief Engineer:

The plan of bridge adopted by the company comprises 11 spans of iron superstructure, each span 250 feet in length, elevated 50 feet above high water, and supported on one stone masonry abutment and 11 piers formed of cast-iron columns, eight and one-half feet in diameter, filled with cement masonry. The foundations of the abutment and the piers extend to the bed-rock underlying the sand, which is found at an average depth of 60 feet below low water in the river.

The plan also provided for the construction of an ice-breaker column on the up-stream side of each pier, to extend from the bed rock to high-water level, but this was afterward abandoned as not essential to the safety of the bridge, the ice always leaving the pier at low water, in pieces comparatively small, and at a low velocity, furnishing in this a noticeable contrast to the manner in which the ice breaks up in the Mississippi. Moreover, the direction of the current in the Missouri varies so greatly that an ice-breaker fixed at one end of the pier would be almost useless. When the ice broke up last spring the current carried it against the piers at an angle of sixty degrees from the line of the usual direction of the current. No fear is entertained of any damage being done to the bridge by ice, but stone will be filled in around each pier to the level of high water to protect the columns from being run into by steamboats.

The original plan has also been modified so as to provide for the use of the bridge for highway travel on the same level with the track of the railway—and wrought iron has been substituted for cast iron in the columns above high water.

A contract for the construction of the bridge was made with L. B. Boomer & Co., of Chicago, September 5, 1868, and the work of sinking iron columns for piers was commenced in February, 1869. The work was afterward suspended for a period of eight months, and was resumed under a modified contract, which stipulates that the work of sinking columns and erecting superstructure shall be done under the management of the engineer of the railroad company, all the iron work to be manufactured and furnished by the contractors, L. B. Boomer & Co.

Since the resumption of work in April, 1870, the operations of sinking columns and erecting superstructure have been vigorously prosecuted. Ten steam engines have been in use for a greater part of the time for the purpose of operating the pneumatic machinery, hoisting cylinders and the iron work of the superstructure into position, driving piles for temporary platforms and bridges, and excavating sand from within the columns. An average of 250 men have been employed upon the work.

The portions of the iron columns below water were cast in sections of ten feet each, having internal flanges at the ends, by means of bolts passing through which the sections were securely fastened together. The ends of the sections were faced off in a lathe, and a red lead joint was used to make them air tight. The wrought-iron portion of the column (above high water) is also in sections of ten feet, the sections being fastened together with rivets. The thickness of the iron in this portion varies from one-half inch at the bottom to three-eighths of an inch at the top. The thickness of the cast-iron portion is one inch and a half.

The columns were first sunk as far as possible by the application to the top of the column of a weight connected with a lever. The water was then expelled from within the column by the pressure of air forced in with a steam pump, and the column within was excavated by laborers down to about two feet below the bottom of the column, and taken out in small bags or buckets at the top. The air pressure was then withdrawn and the column sunk a distance varying from six inches to eighteen and a half feet, according to the character of the materials through which the column was passing. The latter distance was the greatest descent made by any column in twenty-four consecutive hours.

The process of sinking iron columns is similar to that which has been largely used in Europe and in India, for like purposes, and for a few bridges in this country. By no other known method can subaqueous foundation be obtained with equal certainty and economy where the depth necessary to secure stability is very considerable.

The system is especially applicable to the construction of foundations for bridges across rivers similar to the Missouri, where the river bed is composed chiefly of sand, and is liable to scour to depths of 50 or 60 feet. In the process of excavating sand from within the columns, lignite, rotten wood and bones of animals were found at the depth of 50 feet below low water, showing that the river bed has been scoured to that extent at least.

The upper surface of the rock, in every case where the columns reached it, was found to be worn smooth, presenting an appearance very similar to the effect produced on rock by the attrition of sand under great pressure. For greater security the rock at the base of the columns was in every instance excavated to form a recess into which the columns were sunk, whereby any horizontal motion of the base of the columns is effectually prevented.

The obstacles that were encountered in sinking the columns proved to be of less serious character than had been anticipated. In the prosecution of this work some improvements on methods heretofore in use were adopted, which reduced the cost, and also expedited the construction of the piers.

The least time in which any column was sunk to bed rock from the commencement of the pneumatic process was seven days. The depth of this column below low water is 72 feet. The greatest depth below low water at which any column reached the bed rock is 82 feet.

The greatest pressure to which the men working in the columns were subjected was 54 pounds per square inch in excess of the atmosphere, yet from this extreme pressure, which is beyond precedent in works of this character, no injury or inconvenience resulted to the laborers.

The bridge operations have fortunately been free from serious accidents to life or property. It was apprehended that the exposure of the column laborers to an atmosphere condensed to three times its normal pressure might produce paralysis among the men too severe in some cases to yield to medical treatment; but experience has proved that injuries to persons are not necessarily more frequent in the prosecution of work of this peculiar character than in works of a different description, but of like magnitude. About five hundred men have been employed in sinking columns, only two of whom have died from causes that could be directly traced to the extreme air pressure to which they had been subjected, and in both these cases the men knowingly disobeyed the sanitary regulations that had been adopted for their security. Numerous cases of partial paralysis occurred among the men, but with the medical treatment and hospital recommendations provided at the expense of the railroad company a speedy recovery rarely failed to result.

The superstructure is made of wrought iron throughout, except the upper chord which is of cast iron. The plan is known as Post's truss, and is in common use in the West for railroad bridges. To support the superstructure while it is being placed in position a wooden falsework is used, erected upon a pile foundation. The spans across the channel will be put up during the time the river is closed by ice, through which the piles for the foundation of falsework will be driven.

To connect the bridge with the main-track of the railroad on the west side of the river, a branch line of road 7,000 feet in length has been constructed. From the river bluff to the west abutment, a distance of 700 feet, a timber trestle bridge 60 feet in height has been built. This trestle is intended for temporary use only. A portion of it has already been filled in with earth, and the remainder of the filling will be done at the convenience of the company.

The east approach will be by a continuous grade one and one-half miles in length, commencing on the Council Bluffs table-land, and ascending at the rate of 35 feet to the mile to the east end of the iron bridge. The total quantity of embankment in this approach will be 550 cubic yards. The material for this embankment is being hauled from the bluffs east of the river, an average distance of four miles; a steam-shovel, three locomotives and 100 dirt cars being employed for its excavation and transportation.

All the piers are built up to the full height except two, and those are above the level of high water. Four spans of the superstructure are in position, and the remainder will be completed and the bridge ready for use by the 15th of February.

The weight of the superstructure is one ton per lineal foot, and it is capable of sustaining a weight of ten tons to the foot in addition to its own weight, but it is not intended that a greater load than two tons to the foot shall at any time be brought upon it. A train of the heaviest locomotives would weigh about a ton and a half to the lineal foot.

Each wrought iron piece of the superstructure is tested with a tensile strain of five tons to the square inch of sectional area before being accepted, and this strain is as great as any portion of the bridge will be required to endure under a load of two tons to the lineal foot.

Each span of the bridge, when completed, will also be tested with cars loaded with stone, before trains are run upon it. A test of the first span has already been made, and resulted satisfactorily in all respects.

The total cost of the bridge, with the approaches, is estimated to be, in round numbers, $1,650,000, of which up to December 1 $1,300,000 have been expended.

By an act of Congress the railroad company was authorized to issue eight per cent. bonds, maturing in twenty-five years, to the amount of two-and-a-half millions of dollars, to be secured by a mortgage on the bridge and approaches. These bonds have already been issued and all of them found a ready sale in England. The revenue of the bridge during the first year after its opening, it is estimated will be at least two hundred and fifty thousand dollars. The surplus of income, after the payment of the interest on the bonds, is to be set apart to form a sinking fund to be used in paying the bonds themselves at maturity.

CENTRAL RAILROAD OF GEORGIA.

Report for the Year Ending November 30, 1871.

The Central Railroad and Banking Company of Georgia owns a line of railroad from Savannah westward to Macon, 192 miles, with a branch from Millen to Augusta, 53 miles, and one from Gordon to Eatonton, 39 miles. It leases the Southwestern Railroad of Georgia, 257½ miles, and the Macon & Western Railroad, 103 miles; but its accounts have heretofore been kept separately. The following is the report of William M. Wadley, the President of the company, for the last fiscal year. It is dated at Savannah, December 1:

Since the last annual report the Macon & Western Railroad has been leased by your company, thus forming a continuous line to Atlanta. This lease having been made in the midst of the year, it was deemed best not to incorporate its operations with those of the Central and Southwestern roads until the fiscal year, commencing on the 1st instant; therefore the earnings and expenses of that road are taken from the report of its officers. The result from operating the three roads, viz.: Central, Southwestern, and Macon & Western, with Central Railroad Bank, is as follows:

Central Railroad earnings for the year ending 30th ultimo		$1,855,487 30
Central Railroad Bank earnings for the year ending 30th ultimo		79,789 78
Southwestern Railroad earnings for the year ending 30th ultimo		1,079,455 28
Macon & Western earnings for the year ending 30th ultimo		674,921 44
Total earnings of the three roads and bank		3,689,653 80
From this deduct:		
Central Railroad expenses	$1,127,202 35	
Central Railroad Bank expenses	23,339 69	
Southwestern Railroad expenses	676,182 25	
Macon & Western Railroad expenses	408,072 33	
		2,234 796 62
Leaving net		1,454,857 18
This sum has been disposed of as follows:		
Interest on Central Railroad bonds	$55,160 00	
Interest on Southwestern Railroad bonds	48,370 50	
Interest on Macon & Western Railroad bonds	10,500 00	
Dividend Central Railroad in June	250,000 00	
Government tax on same	6,250 00	
Dividend Southwestern Railroad in June	168,205 95	
Government tax on same	4,205 15	
Dividend Macon & Western Railroad in July	125,000 00	
Government tax on same	3,125 00	
Dividend Central Railroad this day	250,000 00	
Government tax on same	6,250 00	
Dividend Southwestern Railroad this day	168,464 00	
Government tax on same	4,211 60	
Dividend Macon and Western Railroad this day	125,000 00	
Government tax on same	3,125 00	
Rent Augusta & Savannah Railroad	73,000 00	
Rent Eatonton Branch Railroad	14,000 00	
Appropriated for rails	130,000 00	—$1,414,867 20
Leaving balance of		$9,989 98

The business of your own road, as well as those leased by your company, has fallen off very much during the past year. This has been caused by a very material reduction in the cotton crop tributary to our road, and also by fierce competition from other lines of transportation which have been opened. These lines have not only taken some of the business that has heretofore passed over your road, but they have reduced the rates of transportation in some cases below remunerating prices. Such competition would only produce a healthful result if there was business in the country to support more than one line; but with the limited amount of traffic, it must result disastrously to some if not to all that are contending for the business.

Seeing that your road would be obliged to encounter this competion, the board endeavored as far as possible to protect your interests, and to this end the Macon & Western Railroad has been leased. By the terms of this lease the stockholders in that company are to receive the same dividends that are paid to the stockholders in your company.

Liberal as these terms are, there were parties who sought to defeat the lease, and for that purpose applied for and obtained an injunction. This injunction, after having been sustained by the court below, was carried to the Supreme Court of the State, and by it dissolved.

In view of the competition referred to, and the fact that the country does not afford sufficient business at low rates to support all the lines that are contending for what there is, the Board is obliged to acknowledge that the prosperity of your road may be seriously damaged for some time to come. These competing lines must, however, sooner or later, find it absolutely necessary to charge remunerating rates in order to render them self-sustaining; and when that is done, it is confidently believed that the prospects of your lines will brighten. In the meantime, with strict economy, the Board is of the opinion that reasonable dividends may be continued.

The operations and condition of the Central and Southwestern roads are fully set forth in the reports of the General Superintendents and heads of departments; the board, therefore, respectfully refer you to these reports for detailed statements and information respecting the condition of your property.

As the operations of the Macon & Western Railroad have been carried, under its organization prior to the lease, up to the close of the fiscal year, it is deemed best to publish the reports of its officers, as an accompanying document, in order that you may be fully informed as to its business and condition.

By the report and balance sheet of the cashier of the bank, you will be informed as to its operations. The profit from this source has not been as large as it was the previous year; but, in view of the small amount of capital that we have for banking purposes, the result is regarded as favorable. The agencies at Macon and Albany have been of value to the road, and show a small profit on their business. It was found that the agency at Columbus, mentioned in the last report, could not be of much use to the road, and it was, therefore, thought best not to put it into operation.

Prior to the lease of the Southwestern Railroad, that company offered to extend its road beyond Albany, in the direction of Blakely, on condition that the citizens interested would subscribe one-half of the amount necessary to accomplish the work. Nothing, however, was done towards the extension until the month of March last, when Major A. J. Maxwell made a proposition, which, in effect, was equal to a subscription for one-half of the amount necessary to carry the road to Blakely. The board, therefore, agreed to extend the road in accordance with the original offer of the Southwestern Company, and Virgil Powers, Esq., as Chief Engineer, was directed to place a corp of engineers in the field, and as soon as the line could be located, to put Major Maxwell to work on the grading. It is expected that this extension will be completed so as to transport the next crop, and it is believed it will prove a valuable feeder to the line.

A number of citizens of Houston county having obtained a charter for a road from Fort Valley to Hawkinsville, via Perry, made application to the board to incorporate said charter into the Southwestern Railroad Company, and to build the road to Perry, if no further. This proposition was accompanied by a bonus, to be given instead of a subscription to the capital stock of the Southwestern Railroad Company. As the proposed branch would penetrate the most fertile part of Houston County, the board agreed to accept the bonus and build the road to Perry. The line has been located, and as soon as the right of way can be obtained it is proposed to put the work under contract. For further information in reference to this branch road, and the extension from Albany to Blakely, you are respectfully referred to the report of the Chief Engineer.

It is not supposed that either the branch to Perry or the extension to Blakely will pay a profit to themselves, but they will afford facilities to the citizens of each section, and may throw an increase of traffic upon the main line, which will, to some extent, compensate for the capital invested.

The foregoing, with the reports of the Superintendents and Chief Engineer, accompanied by the report of the President of the Macon & Western Railroad, will place you in possession of all the information necessary to a full understanding of your affairs.